

FISCAL YEAR 2005 MONITORING AND EVALUATION REPORT



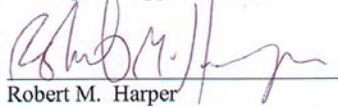
LAND and RESOURCE MANAGEMENT PLAN

November 2006

APPROVAL AND DECLARATION OF INTENT

I have reviewed the FY 2005 Monitoring and Evaluation Report for the Chippewa National Forest that was prepared during 2005. The Monitoring and Evaluation Report meets the intent of both the Forest Plan (Chapter IV) as well as the 2005 planning regulations contained in 36 CFR 219.

This report is approved:


Robert M. Harper
Forest Supervisor

11.22.06
Date

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EXECUTIVE SUMMARY

FISCAL YEAR 2005 MONITORING & EVALUATION REPORT

Chippewa National Forest

This is the first Monitoring and Evaluation Report compiled under the 2004 Chippewa National Forest Plan. The plan was signed by Regional Forester, Randy Moore, on July 30, 2004. Our Monitoring and Evaluation plan is described in Chapter IV of the Forest Plan. As explained in more detail in Chapter IV, monitoring items consist of mandatory components you will find in every forest plan as well as monitoring items that are tailored to address issues raised through public scoping and interdisciplinary team review.

The annual monitoring and evaluation report (M and E) provides an opportunity to track progress towards the implementation of revised forest plan decisions and the effectiveness of specific management practices. The focus of the evaluation is in providing short and long term guidance to ongoing management. The M and E report should include components such as:

- (1) Forest accomplishments toward desired conditions and outputs of goods and services.
- (2) Forest Plan Amendment Status.
- (3) Status of other agency/institution cooperative monitoring.
- (4) Summary of available information on MIS or comparable species.
- (5) Summary of large scale or significant projects or programs.
- (6) Update of research needs
- (7) Public participation/disclosure plan

These components, except for (7), are discussed in the M and E report.

According to 36 CFR 219.6(a) (3) and (b)(2), monitoring results must be evaluated annually and provide for:

- (i) Monitoring to determine whether plan implementation is achieving multiple use objectives;
- (ii) Monitoring to determine the effects of various resource management activities within the plan area on the productivity of the land;
- (iii) Monitoring of the degree to which on-the-ground management is maintaining or making progress toward the desired conditions and objectives for the plan; and
- (iv) Adjustment of the monitoring program as appropriate to account for unanticipated changes in conditions.

The information gained from the M and E report is used to determine how well the desired conditions, goals, objectives, and outcomes of the forest plan have been met (items (i) and (iii) above). However, at this point, just one year after implementation of the revised Forest Plan, trends, patterns, and results are not clearly defined. Therefore, evaluations and conclusions that would lead to changes in the Forest Plan are not expected (items (ii) and (iv) above). Rather, this report focuses more on what we monitored, how it was monitored, how easy and how efficient the monitoring protocols were to use, and how effective they were at answering the monitoring questions.

This report is of value for the public and Forest Service leadership, managers and employees. The M and E report describes to the public how their public lands are being managed and how effectively the commitments made to them through the Revised Forest Plan are being met. The M and E report also provides a readily available reference document for Forest Service managers as they plan, evaluate the effects of actions on resources, and implement future projects.

Key Events in FY 2005

Development of Monitoring Implementation Guide and Monitoring Program

After signing the Forest Plan, the next task at hand was the development and completion of the Monitoring Implementation Guide. The Monitoring Implementation Guide is currently in draft form but will provide specific technical guidance that describes how, where, and when to accomplish the monitoring prescribed in the forest plan. It will provide specific methods, protocols and analytical procedures. The guide is intended to be flexible and could be modified in response to new information, updated procedures or protocols, emerging issues, and budgetary considerations without amending the forest plan. The Monitoring Implementation Guide establishes and schedules the priorities and should ensure efficient use of limited time, money and personnel.

Determination of the monitoring program for FY 2005 required that the Monitoring Implementation Guide be nearly complete. Consequently, actual monitoring for FY 2005 consisted mainly of the annual elements and because time was limited, monitoring of only two areas-- prescribed fire and road closures. The details of these are contained in this report.

Stand boundary re-delineation

Boundaries for stands across the forest are being re-delineated using digital photography that allows us to delineate features to a much finer scale. Areas such as roads, small wetlands and stand inclusions have been delineated as separate stands. The recent delineations map actual vegetation conditions on the ground where past delineations focused more on mapping manageable stands. The re-delineation work is accompanied by updates to the GIS corporate layers and databases. There have been numerous corrections in forest typing and year of origin. This effort started in 2005, continued through 2006, and will be completed in 2007.

Corporate Databases

The Forest Service developed a number of National Corporate databases in recent years designed to house inventory and monitoring data. These corporate databases will eventually replace our local databases that have limited applicability. The national databases include TERRA for soils, TERRA for non-native invasive species, FAUNA for wildlife, TESP for sensitive plants, WATER for streams, lakes, and structures, FACTS for activity reporting and tracking, FSVEG for vegetation data, and INFRA for roads and gate information. Emphasis has been on downloading these modules, training on how to use them, identifying and collecting data that is compatible with the respective database, and migrating existing data.

Annual Activity Review

In 2005, members of the Forest Leadership Team spent a day reviewing several projects on the Walker Ranger district. Personnel from across the forest gathered to look at sites and discuss the following: road obliteration and decommissioning closures, lowland harvest, conifer underplanting for diversity, prescribed fire treatments, and variable density thinning. Objectives for each of the site visits are briefly described below.

1. Road obliteration and decommissioning closures

In recent years, in an effort to provide safe, cost effective, environmentally sound, and a

minimum transportation system, the Forest has obliterated or decommissioned system, unclassified, and temporary roads using a variety of techniques. This site visit focused on the following:

- protocol developed and used for monitoring closure effectiveness
- effectiveness of different types of closures
- funding and scheduling necessary to accomplish closures

2. Harvest in lowland conifer stands

The 2004 Forest Plan includes harvest of lowland conifer stands under the premise that it is important to have ecological representation of young/open growth stages of lowland forest types. There has been debate internally and externally on the suitability for timber production on many of these sites.

Since 1991, about 860 acres of lowland conifer stands have been regenerated. As a result of this onsite visit and discussion, the Forest will conduct stocking surveys on all these stands in 2006 to determine the level of stocking and species composition. The results will be the basis for future discussions and recommendations on timber suitability and appropriate treatments in lowland conifer stands.

3. Conifer Underplanting for Diversity

One of the forest plan objectives is for increased conifer diversity in many of our stands. There are a variety of ways and associated costs to accomplish this. This site visit was designed to discuss achieving this objective through planting or through natural regeneration and the costs and activities necessary to ensure success.

4. Prescribed Fire

Burning is being prescribed to meet a variety of objectives that range from reducing fuels, achieving site preparation, and restoring fire on sites. This site visit was designed to become familiar with the fire protocol used for monitoring and to determine if burn objectives were met on this particular unit.

5. Variable Density Thinning

One of the ways to increase diversity in plantations ready for commercial thinning is to vary the density of trees, vertical diversity, and species composition across the stand. The challenges of effectively implementing variable density thinning using Forest Service employees or contractors were discussed at this site.

Other Project Monitoring

Monitoring of projects, large and small, occurs on all the districts and involves numerous resource professionals across the forest. Examples include sale administrators checking loggers for compliance with contract specifications; field checking timber marking to determine consistency with marking guides; conducting regeneration surveys to determine stocking levels, checking harvest units to determine if results incorporated and achieved silvicultural prescriptions objectives and EA direction, checking application of mitigation measures to determine if they are appropriate and effective. Often times the monitoring is informal consisting of general field observations. Other times monitoring is more formal and entails following

protocols. Results from formal monitoring efforts are generally included in the monitoring and evaluation reports.

Public Involvement

We continue to publish the *Chippewa National Forest Quarterly*, a schedule of proposed actions and decisions that implement the Forest Plan. We encourage the public to become part of our management process by commenting on project proposals through the NEPA process.

Information about planning our projects and project contacts can be found on the Internet at [www.fs.fed.us/r9/forests/chippewa/projects & plans](http://www.fs.fed.us/r9/forests/chippewa/projects&plans).

MONITORING & EVALUATION REPORT

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MONITORING & EVALUATION REPORT

I. INTRODUCTION

This is the first Monitoring and Evaluation Report compiled under the 2004 Chippewa National Forest Plan. The Record of Decision was signed by Regional Forester, Randy Moore, in August 2004. Our Monitoring and Evaluation plan is described in Chapter IV of the Forest Plan. As explained in more detail in Chapter IV, monitoring items consist of mandatory components you will find in every forest plan as well as monitoring items that are tailored to address issues raised through public scoping and interdisciplinary team review.

After signing the Forest Plan, the next task at hand was the development and completion of the Monitoring Implementation Guide. With this as the primary focus for FY 2005, actual monitoring was limited and consisted of the annual elements and more in-depth monitoring in two areas-- prescribed fire and road closures. The details of these are contained in this report.

Chapter II consists of monitoring for 13 elements from the Monitoring Matrix of the Forest Plan tied to specific resource areas. Each of these includes some background information, a brief explanation of the monitoring activities and protocol used, and discussion on the evaluation or conclusions when feasible. These 13 items are followed by a discussion of results from monitoring of blueberry production and riparian areas on the Sand Plain project and MFRC monitoring.

Chapter III provides a brief summary of on-going research and studies on the Forest.

Chapter IV discusses adjustments or corrections to the Forest Plan.

Chapter V is a list of the Forest Service employees that provided information contained in this report.

II. DISCUSSION OF MONITORING

The following table consists of elements from the Monitoring Matrix, Table MON-4 of the Forest Plan. It identifies the resource element, the monitoring question, drivers, and frequency of measure that are discussed on the pages that follow in this report. They are presented in the order presented in the table.

Table 1: Resource areas, monitoring questions drivers, and measure frequency discussed in this report.

	Resource	Monitoring Question(s)	Driver (Applicable CFR's, FP Desired Conditions, and FP Objectives)	Measure Frequency
1	All	How close are projected outputs and services to actual?	(36 CFR 219.12(k)[1]. A quantitative estimate of performance comparing outputs and services with those projected by the forest plan;	Annual
2	All	How close are projected costs with actual costs?	(36 CFR 219.12(k) [3]. Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the forest plan.	Annual
3	Social & Economic Stability	To what extent does output levels and location of timber harvest and mix of saw timber and pulpwood compare to those levels projected?	CFR 219.19.12(k)[1]. A quantitative estimate of performance comparing outputs and services with those projected by the forest plan;. 36CFR 219.7(f).A program of monitoring and evaluation shall be conducted that includes consideration of the effects of National Forest Management on land, resources, and communities adjacent to or near the National Forest being planned and the effects upon National Forest management from activities on nearby lands managed by other Federal or other government agencies or under the jurisdiction of local governments. D-TM-1, O-TM-1	Annual
4	Recreation Motor Vehicles	To what extent is the Forest providing ORV opportunities; what are the effects of ORV's on the physical and social environment; and how effective are forest management practices in managing ORV use?	36 CFR 219.21[g]. Off-road vehicle use shall be planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other uses of the National Forest System lands. Forest planning shall evaluate the potential effects of vehicle use off roads and, on the basis of the requirements of 36 CFR 295 part of this chapter, classify areas and trails of National Forest System lands as to whether or not off-road vehicle use may be permitted. D-ORV-1, 2. O-ORV-1, 2.	Annual

	Resource	Monitoring Question(s)	Driver (Applicable CFR's, FP Desired Conditions, and FP Objectives)	Measure Frequency
5	Transportation System	To what extent is the Forest, in coordination with other public road agencies, providing safe, cost effective, minimum necessary road systems for administrative and public use.	D-TS-1,2,3,4. O-TS-1,2,6,7,8.	1-5 years
6	Wildlife: Threatened and Endangered Species	To what extent are road and trails closures effective in prohibiting unauthorized motor vehicle use?	G-WL-7, G-ORV-4, O-TS-3, O-TS-7, S-TS-3, S-TS-7, and G-TS-12 , G-TS-16	1-5 years
7	Wildlife: Management Indicator Species	What are the population trends of management indicator species?	36 CFR 219.19(a)(6). Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies, to the extent practicable. O-WL-1, O-WL-15, O-WL-16, O-WL-32. O-WL-33.	Annual
8	Wildlife: Management Indicator Species	To what extent is Forest management moving toward short term (10-15 years) and long-term (100 years) objectives for habitat conditions for management indicator species and species associated with management indicator habitats?	D-WL-1-9. O-WL-1-3. O-WL-15, O-WL-16, O-WL-32, 33, 34	1-5 years

	Resource	Monitoring Question(s)	Driver (Applicable CFR's, FP Desired Conditions, and FP Objectives)	Measure Frequency
9	Wildlife: Non-native Invasive Species	To what extent is Forest management contributing or responding to populations of terrestrial or aquatic non-native species that threaten native ecosystems?	D-WL-9. O-WL-38 & 39.	1-5 years
10	Timber	Are harvested lands adequately restocked after five years?	(36 CFR 219.12(k)[5][i]. Lands are adequately restocked as specified in the forest plan	Annual
11	Insects & Disease	Are insects and diseases populations compatible with objectives for restoring or maintaining healthy forest conditions?	(36 CFR 219.12(k)[5][iv]. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities. D-ID-3, O-ID-1, D-VG-5, D-VG-8, O-VG-11-13	Annual
12	Fire	How, where, and to what extent will prescribed fire be used to maintain desired fuel levels, and/or mimic natural processes, and/or maintain/ improve vegetation conditions, and/or restore natural processes and functions to ecosystems?	D-ID-4-5, O-ID-2-4	1-5 years
13	Tribal Rights and Interests	Is Forest management helping to sustain American Indians' way of life, cultural integrity, social cohesion, and economic well being?	D-TR-1. O-TR-1. O-TR-3.	Throughout the year
	Tribal Rights and Interests	Are government to government relationships functional?	D-TR-2. O-TR-2. O-TR-4.	Throughout the year
	Tribal Rights and Interests	Is the Forest facilitating the right of the Tribes to hunt, fish, and gather as retained via treaty?	D-TR-3.	Throughout the year

Project monitoring occurred on the Sand Plains project which was implemented in 2003. In addition, Minnesota Forest Resources Council (MFRC) monitoring coordinated by the MN Department of Natural Resources (DNR) was conducted in FY 2005. These items are not included on the Monitoring Matrix Table (Table MON-4) in Chapter 4 of the Forest Plan. You will find discussion at the end of Chapter III on these monitoring items.

Table 2: Sand Plan Project and MFRC

	Resource	Driver (Applicable CFR's, FP Desired Conditions, and FP Objectives)
14	Sand Plains Project Blueberry Production Riparian Management Zones MFRC Monitoring	A program of monitoring and evaluation shall be conducted that includes consideration of the effects of National Forest Management on land, resources, and communities adjacent to or near the National Forest being planned and the effects upon National Forest management from activities on nearby lands managed by other Federal or other government agencies or under the jurisdiction of local governments. (36 CFR 219.7(f). Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11(d).

1. All – Outputs

The information presented below is for timber harvest. There is also output information on road decommissioning presented in Section 5 – Transportation.

Monitoring Question:

How close are projected outputs and services to actual?

Monitoring Driver:—Desired Condition and Objectives:

(36 CFR 219.12(k)[1]. A quantitative estimate of performance comparing outputs and services with those projected by the forest plan.

Background:

Outputs for timber are discussed in this section. Figures for the projected outputs are from Appendix D. Proposed and Probable Practices, Goods Produced, and Other Information (Forest Plan, pages D-1 through D-3).

a. Timber harvest --Evaluation and Conclusions

The Chippewa National Forest harvested timber on a total of 3,997 acres in FY 2005. Listed below is a table comparing the acres harvested by treatment method to the Proposed Decade 1 (Table APP-D2: Forest Plan, D-3, Estimate of Acres of timber harvest by treatment method (Forest Wide).

Table 3: Comparison of acres harvested by treatment method to the Proposed Decade 1

Treatment Method	Decade 1 (Proposed)		Actual Accomplishment (FY 2005)	
	Acres	Percent	Acres	Percent
Thinning	6749	9	2,172	54
Clearcutting	29,866	39	949	24
Shelterwood/Partial Cut 30	11,149	14	489	12
Uneven-age (all forest types)	29,375	38	387	10
Totals	77,139	100	3,997	100

The Decade 1 harvest treatment numbers projected in the Forest Plan are decadal projections not annual projections and are based on full funding and implementation of the Plan. Mixes of potential harvest treatments is a tool to accomplish Forest Plan objectives but are not an objective in and of themselves. Harvest treatment acres in any fiscal year are a reflection of the relatively few environmental decisions being implemented during that year. Each environmental analysis

(EA) and the set of harvest treatments resulting from that decision are based on meeting the vegetation objectives for the Landscape Ecosystem (LE) in which the project is being implemented. Vegetation objectives and existing conditions vary by LE, so some peaks and valleys are expected in annual harvest treatment types, but over the decade meeting the vegetation objectives across a mix of project areas should yield harvest treatments similar to those projected in the Plan. Comparing the percentages on an annual basis will be useful as harvest treatments are tracked over time. Based on current percentages, thinning acres are over accomplished. There are several reasons for this. This is in part a reflection of a large thinning project that was implemented in the first two years of Forest Plan implementation. In addition, our highest priority LEs for treatment tend to be the Dry Mesic Pine and Dry Mesic Pine-Oak LEs. These are the LEs that are most out of sync ecologically and have the highest fire hazards. Red pine is a significant component on these LEs and has been a focus for treatment. In addition, there is a large amount of red pine that has recently become the age and size that would benefit from commercial thinning. Consequently, the apparent high percentage of thinning is not a concern at this time.

Clearcutting is slightly under-utilized compared to the Forest Plan projections. The proposed and actual percentages are relatively close. During Forest Plan revision it was recognized that there would be less regeneration in the initial years of Forest Plan implementation as the youngest vegetation age classes are over-represented in most LEs. The actual percentage of shelterwood and partial harvest is comparable to that proposed in the Plan. The percentages of clearcutting and shelterwood harvest are not a concern at this time. Uneven-aged harvest prescriptions are significantly under-utilized at this time. It may be difficult to meet the decadal Forest Plan objectives for uneven-aged management at the current rate.

2. All -- Costs

Site preparation and stand tending activities are discussed in this section. A discussion of timber costs is included in Section 3, Social & Economic Stability.

Monitoring Question:

How close are projected costs with actual costs?

Monitoring Driver—Desired Condition and Objectives:

36 CFR 219.12(k) [3]. Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the forest plan.

Background:

The actual costs of a sample of selected management practices are compared to those cost estimates used in the analysis of the Forest Plan alternatives. Management practices that cost far more or less than used in the analysis may result in a re-analysis of the economic and social effects of the selected alternative or it may become apparent that implementation of one or more portions of the Forest Plan is not feasible and a Plan amendment would be necessary.

Monitoring Activities:

Actual FY 2005 costs for selected parameters were compared to the cost estimates used in the modeling for FEIS analysis. These costs are displayed in FEIS Vol II, Appendix B pages B-8 through B-10. These are compared to project costs incurred during implementation which are stored in the FACTS corporate database. These costs do not include overhead or administration costs.

Evaluation and Conclusions:

Table 4: *Actual versus Estimated Costs of Management Practices - FY 2005*

Practice	FEIS Modeling Estimate (Dollars per acre)	FY 2005 Actual Cost (Dollars per acre)
Site preparation – Prescribed Fire	143	278
Single Release	133	163 + contract administration
Animal Browse Protection	53-133	52
Pathological Pruning	124	83
Planting	218	222 + contract administration

Costs for site preparation for prescribed fire are highly variable and tend to go down as larger areas are burned at one time. The above numbers are an average of four projects conducted in FY 2005 of 50 acres or less each. In years where larger project areas are burned, the costs would be closer to those used in Forest plan modeling, but in this year actual costs were nearly double those used in modeling the Forest Plan.

The actual costs of browse protection and pathological pruning were lower than those used in modeling and the actual costs of release and planting were somewhat higher than those used in the modeling.

The FEIS also used expected revenues to model cost benefit ratios for all alternatives. Expected revenues were based on the average prices from 1996-1998.

Table 5: Actual verses Estimated Revenues from Timber Production FY 2005

Species	Product	1996-1998 Avg. Price /MBF Expected Revenue	FY 2005 Avg. Price/MBF	Percent Difference
Aspen	Pulpwood	59.30	123.95	52
Mixed Hardwoods	Pulpwood	28.13	40.07	30
Mixed Hardwoods	Sawtimber	54.12	54.42	<1
Balsam Fir	Pulpwood	61.96	78.33	21
Spruce	Pulpwood	64.38	99.84	36
Spruce	Sawtimber	75.41	129.56	42
Pine	Pulpwood	28.50	24.02	(18)
Tamarack	Pulpwood	60.09	88.75	32
Jack Pine	Sawtimber	127.13	101.45	(25)
Red/White Pine	Sawtimber	238.63	124.62	(91)

Overall revenues in FY 2005 were significantly higher than those estimated in the FEIS analysis. Exceptions are evident for pine. Pine harvested in FY 2005 was mainly smaller diameter pine from thinning operations rather than the higher valued sawtimber. This explains, in part, the lower revenues.

Recommendations:

The Forest Plan itself does not use cost estimates and does not propose objectives based on projected costs. The Forest Plan uses Net Present Value (NPV). Economic benefits were used in the FEIS to compare the difference between the Net Present Value of each of the alternatives. Net Present Value is a measure of how efficiently the Forest Service is using tax dollars to obtain the Forest Plan goals. NPV is defined as the value of discounted benefits (or revenues) minus discounted costs. A full NPV analysis includes all outputs including timber and recreation, to which monetary values are assigned. NPV estimates, as required by NFMA (36 CFR 219), attempt to condense a large amount of information into a single value and for that reason should be used appropriately.

In summary, costs are higher than estimated but this is offset by higher than estimated revenues resulting in NPVs that relate favorably to those projected for the selected alternative. There is no need to amend the Plan at this time based on these numbers.

3. Social & Economic Stability

Monitoring Question: To what extent does output levels and location of timber harvest and mix of saw timber and pulpwood compare to those levels projected?

Monitoring Driver:

D-TM-1 The amount of commercial timber sales available for purchase is at a level that is sustainable over time. Mill operation in northern Minnesota can depend on a consistent level of timber harvest on the National Forest.

O-TM-1 Provide commercial wood for mills in northern Minnesota. Harvested material supplies sawmills, veneer mills, paper mills, and mills constructing engineered wood products (hardboard, particleboard, oriented strandboard, etc.). The Forest also provides posts, poles and logs for log home construction.

Background:

This information is similar to the monitoring in the 1986 plan. The information below was compiled from actual sales that were offered during FY 2005 and is a reflection of the forest's ability to satisfy local demand for wood products.

Monitoring Activities:

Types of information monitored include the amount of volume offered, the number acres offered, amount of volume harvested, amount of volume under contract. The volume offered is further broken down into sawtimber and pulpwood. The amount of volume offered is negotiated with the regional office each year and is more a reflection of the budget than the capability of the land. Information provided below is from the FY 2005 Annual Bid Monitoring Report and the Timber Cut and Sold Report (Timber Sale Statements of Accounts (TSA)).

Evaluation and Conclusions:

FY 2005 was the first full reporting year under the 2004 Revised Forest Plan. In FY 2005 the assigned forest target was 27,000 thousand board feet (MBF) and was based on volume offered to the public for sale. This is an increase of approximately 23% above FY 2004 when the assigned target was 22,000 MBF. The actual volume offered in FY 2005 was 27,184 MBF. This is an increase of approximately 13% from FY 2004 when 24,101 MBF was offered.

Increasing efficiency and reducing unit costs has been a top emphasis for the Forest for the last few years. This effort continued in FY 2005 as the Forest emphasized efficiencies in process and delivery. In comparison with FY 2004, we gained in efficiency by approximately 16%.

Competition for the Chippewa National Forest timber volume remained strong and the declining number of Timber Sale bidders did not continue during FY 2005. There were 28 bidders during FY 05 as compared to 16 in FY 2004. The increase in total bidder numbers may have been due to the triggering of the Small Business Association (SBA) Set-Aside Program which has not happened on the Chippewa for many years.

As of September 30, 2005, the Chippewa National Forest had 43.2 million board feet (MMbf) of uncut volume under contract, an increase of 3.5 MMbf from the end of FY 2004. An increase in volume under contract has not happened since 1996. Volume harvested was 26.8 MMbf.

The 2004 Revised Forest Plan projected a 32:68 ratio of sawtimber to pulpwood in Decade 1. In FY 2005, sawtimber decreased from 21% to 15% of the total volume sold resulting in a 15:85 ratio of sawtimber to pulpwood.

It is evident that pulpwood prices of most species increased at a more rapid rate in FY 2005 compared to sawtimber prices. The average bid price for sawtimber decreased by 5% and the average bid price for pulpwood increased by 60% as compared to FY 2004. This resulted in a 43% increase in the average bid price for all species/products combined to \$100.39 per MBF.

The bid ratio (advertised value/bid value) for FY 2005 was 61%. The reason for the large increase in average combined selling values and low bid ratio was an exceptional increase in bid rates for aspen pulpwood. The average selling value for aspen pulpwood increased 58%, from \$78.27/MBF to \$123.95/MBF. (More detailed information is provided in the previous section.)

On average, we received 4.4 bidders per sale, which compared to 3.2 bidders last fiscal year. The number of bidders per sale ranged from zero to eight. There were two single-bid sales. There were four no-bid sales. Milton and Lucille Lake were re-bid and sold. Juvenile Aspen and West Jessie remain no-bids as options for re-advertisement are considered.

Information on timber harvest outputs was presented earlier in Section 1, Outputs.

4. Off Road Vehicles (ORV)

Monitoring Question:

To what extent is the Forest providing ORV opportunities, what are the effects of ORVs on the physical and social environment; and how effective are forest management practices in managing ORV use?

Monitoring Driver – Desired Condition and Objectives:

36 CFR 219.21[g] Off-road vehicle use shall be planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other uses of the NF system lands. Forest planning shall evaluate the potential effects of vehicle use off roads and on the basis of the requirements of 36 CFR 295 part of this chapter, classify areas and trails of NF system lands as to whether or not off-road vehicle use may be permitted.

D-ORV-1 The forest provides ORV road and trail riding opportunities with experiences in a variety of forest environments, while protecting natural resources.

D-ORV-2 Allowed, restricted, and prohibited ORV uses are clearly defined to the public. Where practical, ORV policies are consistent with adjacent public land management agencies.

O-ORV-1 The Forest will determine which existing OML 1 and OML 2 roads are appropriate or inappropriate for ORV use.

O-ORV-2 A maximum of 90 additional ATV trail miles and 100 snowmobile trail miles with associated trail facilities (trailhead parking, signs, toilets, etc.) may be added to the designated NF trail system.

Background:

Background information is presented for three subjects – Roads and Trails, Travel Management Rule, and Law Enforcement.

Roads and Trails:

Current condition includes approximately 20 miles of designated ATV trail. There are 2,549 miles of FS roads on the Chippewa, and currently there are 1,353 miles open to ORV use. Roads open to ORV use are generally the low standard developed system roads, unless they are posted closed to motorized use.

Travel Management Rule:

The Travel Management Final Rule (2006) provides expectations for ORV travel access management on the National Forests. The intent of the Rule is to provide regulation of ORVs as a result of the tremendous increases in the number and power of ORVs; widespread environmental and social impacts from unmanaged recreation; while recognizing that motorized recreation is a legitimate use of National Forest system lands in the right places. Following is a summary of those requirements:

- The Rule requires each national forest and grassland to designate those roads, trails, and areas that are open to motor vehicle use by class of vehicle and if appropriate, time of year. Field units may provide for limited cross-country travel for big game retrieval or dispersed camping if appropriate, to respond to local situations. This authority will be used sparingly.
- Objective Maintenance Level (OML) 1 roads are closed to highway–legal vehicles, but are still needed for long-term access. They will not be displayed on the motor vehicle use map and thus are not open to ORV travel. In special cases, an OML1 road may be designated as a trail and displayed as a trail on a motor vehicle use map.
- OML 2 roads are maintained for high clearance vehicles and would generally be open to ORV use.
- OML 3, 4, and 5 roads are open and maintained for travel by passenger cars and will generally not be open for ORV use. However, there may be some roads available upon recommendation of a mixed-use analysis.

Law Enforcement:

There are two law enforcement officers and 21 forest protection officers on the CNF. Enforcement of forest orders and other appropriate 36 CFR regulations occurs as needed on the Forest. For many years, including FY 2005, there has also been a Cooperative Law Enforcement agreement with Cass and Itasca Counties that provides for a county deputy to work four days a week during the summer while concentrating on National Forest land.

Monitoring Activities:

Motorized Trails:

There have been no new motorized trails constructed or decommissioned during FY 2005. Opportunities remain the same.

Roads and the Travel Management Rule:

The CNF is actively working at implementing the Forest Plan and Travel Management Rule. To effectively and cohesively meet the needs of forest visitors, we are collaborating with the MN DNR; Cass, Itasca and Beltrami Counties; Leech Lake Band of Ojibwe (LLBO); and associated Townships in an interdisciplinary team of recreation, law enforcement, wildlife, and vegetation managers; FS, DNR and County leadership, elected government officials; and lay people as sponsored by counties.

From the collaborative group, there has been a Planning ORV Team convened to strategically plan the ORV analysis process, and subsequently there has been Working Groups convened to addresses issues needing recommendations. Working group task examples include recommending roads as open or closed to ORV access; ORV trail opportunities; ORV informational and regulatory signing; and mixed use analysis on roads.

There have been five community public informational meetings (fall 2005) to inform people about the expectations of the Travel Management Rule and to involve people in finding out what is important to them about specific road/trail ORV opportunities within the Forest along with other concerns people may have regarding ORV use. These meetings were jointly hosted by the FS, DNR and each county to emphasize the shared and overlapping opportunities each public land management agency provides.

Law Enforcement:

Law enforcement personnel which include Forest Service, State, Counties, Local and Tribal officers, monitor and respond to activities and behavior on the National Forest and adjoining lands.

Offenses are combined for reporting purposes into categories. ORV offenses may be included in 1) occupancy and use offenses and 2) travel management restrictions on and off road offense categories. The trend from 2002 to 2005 has been in each of these categories has reflected an increase, and a decrease in 2005. The decrease in law enforcement offenses reflects a change in directed priorities of the law enforcement officers and a change in the numbers of forest protection

officers. Qualitative information from Forest Service employees reflects no decrease in the illegal use of ORVs on the Forest over the past three years. Following is a table indicating criminal ORV offenses by year as recorded in the Law Enforcement Annual Report (LEIMARS records).

Table 6: *Criminal ORV offenses by year.*

Incident Type	2002	2003	2004	2005
ORV	21	142	52	71

Criminal offenses relating directly to the illegal use of ORVs including CFR 261.56 (possesses or uses vehicles off road); 261.54A (using vehicle on road closed by order) are number three and five in the top ten offenses on the Chippewa in FY 2005.

Evaluation and Conclusions:

The outcome of monitoring is potential change in management within the context of the Forest Plan. Information gathered during this year's monitoring process has not been gathered in prior years under the 1986 Forest Plan. Initial information establishes the baseline for the next decade.

The work done to implement the Forest Plan and Travel Management Rule is ongoing, iterative and specifically involves many components such as roads, signs, trails and available motor vehicle use maps, and law enforcement. NEPA environmental analysis that addresses implementation of ORV motor vehicle access proposals will be done in the future to arrive at decisions regarding motor vehicle access. Public information and education must be widely done to protect the social and recreational opportunities visitors coming to the National Forest participate in and also to protect the natural resources of the Forest. To date the work has involved the following.

Closed/Open to ORVS OML 1 and 2 Roads:

Each DNR, County, and Forest Service OML 1 and 2 (or the agency equivalent) road was reviewed and recommended to be open or closed for ORV travel. The work clarified the current condition of the roads as per Forest Plan direction. Most of the OML 1 and 2 roads are short spurs, but do include some longer OML 2 roads. Each road was defined as open or closed year-round or by season. If the road was recommended for ORV access restrictions then the reason was identified. Those reasons included social and natural resource conditions, including but not limited to threatened and endangered species habitat, wet soils, and proximity to non-motorized areas.

OML Road Designation Changes:

During the process, some roads were identified as not having the correct OML designation. The INFRA data did not match with the actual condition and intention for the road. These changes will be made.

Mixed Use OML 3, 4, 5:

OML 3, 4, and 5 roads were reviewed and some were identified for possible mixed use that would include ORVs along with highway-licensed vehicles. These roads provide connections between the OML 2 roads and the chance to ride for long distances. Roads were identified for potential mixed use and now are subject to the formal mixed use analysis as defined by the Forest Service. Subsequently, there has been a recent meeting to identify roads that are for reasons of traffic and road configuration unsuitable for further consideration. The Forest Service will continue to analyze roads according to the mixed use analysis process.

Signs:

The sign team is charged to explore the regulatory and information signing on Forest Service, DNR, County, and Tribal roads and how the signs can be as similar/same as possible to benefit visitor's understanding of travel opportunities.

Trails:

Each District of the Forest while working with DNR Trails and Waterways and County employees has identified potential areas for ATV trail development. These areas reflect the existing road riding opportunities; connections to opportunities; linkage to the existing cross-forest corridor trail; and proximity to rural communities. Trails will be more thoroughly explored at a later date (after the road access is defined and mapped) to further implement the Travel Rule and Forest Plan. Trail opportunities will be subject to the NEPA process.

Forest Access Map:

The CNF will provide a motor vehicle use map for the public in January 2008.

Law Enforcement:

Enforcement of regulations and forest orders will continue to occur over the next year.

5. Transportation System

Monitoring Requirement:

To what extent is the Forest, in coordination with other public road agencies, providing safe, cost effective, minimum necessary road systems for administrative and public use?

Monitoring Driver:—Desired Condition and Objectives:

D-TS-1 The existing National Forest System roads that are suitable for passenger vehicles provide

a safe and affordable system for administrative and public access to NFS land.

D-TS-2 The National Forest road system is the minimum needed to provide adequate access to both NFS and non-NFS land.

D-TS-3 The transportation system design considers environmental, social, and health concerns.

D-TS-4 The National Forest road system provides a "seamless" interface with the neighboring public road agencies based on coordinated use, function, and agency goals.

O-TS-1 Improve the safety and economy of National Forest System roads and trails.

O-TS-2 Few new OML 3, 4, and 5 roads will be constructed.

O-TS-6 Decisions will be made on Forest unclassified roads to designate them as a National Forest System road or trail or to decommission them.

O-TS-7 Unneeded roads will be decommissioned and closed to motorized vehicles. Roads that are not necessary for long-term resource management are considered "unneeded".

O-TS-8 The Forest will decommission approximately 200 miles of road.

Background:

Each national forest was required to analyze their main road system (the higher standard roads suitable for passenger cars) to determine the minimum road system that will support land management objectives, provide a safe road system for the public, be responsive to the public needs, and be environmentally sound, affordable, and efficient to manage. The National Transportation Policy and Rule (36 CFR 212) requires Forests to:

- To maintain the minimum road transportation system necessary to provide access to the Forest for its management, for recreation and rural access and to use a science-based roads analysis process to determine that minimum system. Permanent roads on the road transportation system are classified Forest system roads.
- To decommission unneeded unclassified roads.
- To secure a sustainable funding source to improve or restore the main roads to establish a "seamless" interface with the other neighboring public road agencies (Public Forest Service Roads Program).
- To maintain a sustainable flow of goods and services while not compromising the health of the land and water (especially integrating the roads analysis with the pending watershed analysis).

The policy and rules place an emphasis on maintaining and reconstructing existing passenger vehicle roads rather than building new ones, and making the existing Forest road system safe, responsive to the public needs, environmentally sound, affordable, and efficient to manage.

Road decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state.

Evaluation and Conclusions:

In order to meet the decadal objective of decommissioning 200 miles of road, the Forest would need to average approximately 20 miles of decommissioning per year. In FY 2005, the initial road-decommissioning target for system roads was set at 5 miles. This target was increased at midyear to 6 miles, with a final reportable accomplishment of 13.2 miles. The decommissioning was completed through a mixture of tree plantings, placing rock berms at the entrances, and also through natural revegetation. No closures or revegetation of unauthorized (non-system) roads were completed as priority road decommissioning in FY 2005 was for system roads. A total of 53 miles of system roads have been decommissioned since the inception of the Forest Plan. Fifteen signed decision documents have identified an additional 72 more miles of system road and 38.2 miles of unauthorized roads for decommissioning.

No new OML 3, 4 or 5 roads were constructed.

The use of Geographical Information Systems (GIS) has been useful in the tracking of unauthorized roads. A partial inventory of these unauthorized roads was conducted in FY 2005 and 2006 and shows a current total at 612 miles. Numbers are based on information on roads in the INFRA database.

Table 7: Comparison of Operational & Objective Levels

The chart to the right shows a change in System roads of 340 miles. The discrepancy arises from reporting Objective Maintenance level rather than Operational Maintenance levels.

The 2004 Forest Plan used **Operational** Maintenance level inventory data (dating from October 2002) as the baseline mileage. At the end of FY 2004, the Road Accomplishment report was adjusted to reflect **Objective** Maintenance levels rather than **Operational** Maintenance levels.

Maintenance Level	Forest Plan 2004 (Operational) System Miles	FY05 (Objective) System Miles
1	324	272
2	1,753	1,533
3	281	224
4	246	250
5	42	27
Total Miles	2,646	2,306

This administrative reporting change appears to have decreased the total miles of inventoried roads under Forest Service jurisdiction, when in fact it just tracks a different category of inventoried roads. There has also been ongoing data cleanup of all roads, which can also alter the mileage baseline.

Two Forest Road agreements were signed jointly between Itasca County and the Chippewa National Forest in FY 2005. The roads under the agreements receive much higher public use traffic that requires higher standards of maintenance. The Forest Service also does not snowplow roads for winter use. These agreements allow Itasca County to maintain the Forest Service roads to the higher public standard and also keep them open in the winter for public use and access to property. The Forest Service has been able to financially supplement the County for multiple bladings on a road with high recreational use and can also provide gravel or surface material for other County maintained Forest Service roads as a benefit to the county.

Also in FY 2005, a stewardship contract was completed with the US Fish and Wildlife Service to remove beaver dams that are impacting roads and surrounding wetlands. The pro-active cost of

removing the beaver dams through blasting was more cost effective than being reactive to dam removal and risk overtopping or road washouts.

The Forest has been working jointly with State of Minnesota, the Counties, Townships and the Leech lake Band of Ojibwe in part to determine which unauthorized roads will be added to the road and trail system and which will be effectively closed. Site specific analysis of the joint recommendations is expected in 2007 and a final map of motorized travel use is expected in 2008.

The Forest is actively implementing activities and moving towards the objectives for road decommissioning, defining the minimum needed transportation a system and providing a seamless interface with the neighboring public road agencies.

It appears that the road decommissioning needs may have been under estimated in the Forest Plan, particularly in regard to the unauthorized roads. In the first two years of implementation 163 miles of road have been identified for decommissioning.

Recommendations:

Funding for road decommissioning is not keeping pace with identified needs. An increase in road maintenance funds for decommissioning of system roads should be sought. In addition, funding in other resource areas such as that for Watershed Restoration, Wildlife Habitat and Threatened, Endangered and Sensitive species protection should be directed toward road decommissioning when removal or closure of system or unauthorized roads meets objectives for those resources.

As additional decommissioning needs are identified, a Forest Plan amendment may be necessary.

Recently decommissioned roads should be monitored to ensure they remain effectively closed and are returning to a more natural state.

6. Wildlife: Threatened and Endangered Species

Monitoring Question:

To what extent are road and trails closures effective in prohibiting unauthorized motor vehicle use?

Monitoring Drivers:

G-WL-7 When constructing new snow-compacting trails, access would generally be restricted on those trails, OML 1, OML 2, temporary, and unclassified roads that intersect the new trails unless these trails or roads are needed for other management purposes.

G-ORV-4 Roads that are determined through site-specific analysis to have immitigable resource and social concerns and/or do not meet management objectives will be effectively closed.

O-TS-3 New roads built to access land for resource management will be primarily OML 1 or temporary and not intended for public motorized use. Temporary roads will be decommissioned after their use is completed. All newly constructed OML 1 roads will be effectively closed to

motorized road and recreation vehicles following their use unless they are needed for other management objectives.

O-TS-7 Unneeded roads will be decommissioned and closed to motorized vehicles. Roads that are not necessary for long-term resource management are considered "unneeded".

S-TS-3 As soon as access use is completed, stabilize temporary roads and effectively close them to motorized traffic. Vegetation will be established within 10 years after the termination of the contract, lease, or permit.

G-TS-12 On existing OML 1 roads, an effective barrier will generally be installed as needed to prevent use by highway-licensed vehicles and ORVs. ATV and OHM use may continue to be allowed on some existing OML 1 roads.

G-TS-16 Roads and trails designated for decommissioning will generally be subject to the following:

- a. The road or trail will be rendered unusable by motorized vehicles but may remain accessible to foot travel.
- b. Stream crossing structures will be removed.
- c. Road and trail fills will be removed from flood prone and wetland areas to restore stream and wetland crossings to original contours.
- d. Removed fill will be reused or disposed of in a way that will not restrict flow or contaminate surface water.
- e. Exposed soil will be revegetated.

Background:

Road Closure data is collected and evaluated every 1 to 4 years. Monitoring was conducted in FY 2005 and is tentatively scheduled again for FY 2007. Road closures have been previously monitored at the project level, but this is the first year of data collection at the Forest-wide level. This is a lower intensity/higher extensity implementation monitoring in that many sites are evaluated, but the time spent and the data collected at each site is fairly minimal.

Roads may be closed or decommissioned for a variety of reasons. Temporary roads are roads authorized by contract, permit, lease, other written authorization, or emergency operation for a specific resource management project and are not intended to be a part of the forest transportation system. They are not necessary for long-term resource management and should be decommissioned after use. All Forest Service System roads are assigned an Operation Maintenance Level (OML) with OML 1 being the lowest level of construction and maintenance and OML 5 being the highest. OML 1 roads are intermittent service roads and are closed to street legal motorized vehicular traffic. They may be periodically opened when needed for resource management activities and will generally be managed at OML 2 during the time they are open for traffic. Higher level system roads may be closed or closed seasonally based on resource concerns such as wetland damage or possible impacts to threatened or endangered species. Unauthorized roads are user developed or maintained roads that are not meant to be part of the Forest road system and vehicle travel is not allowed. Project level decisions often include closures of system

roads that are no longer needed for resource management or access. These roads are decommissioned and taken off the road system. No further vehicle use is allowed on these roads, but they may remain open for foot traffic.

Monitoring Activities:

Road closure monitoring looks at the effectiveness of all closures on temporary roads, OML 1 roads, higher level system roads that are closed for specific resource reasons, unauthorized roads and decommissioned roads.

Two areas of the Forest were selected for road closure monitoring in FY 2005. This method of monitoring is meant to be extensive covering large areas and high numbers of sites, but it is of low intensity; spending a short amount of time at each site. The data was collected by forest staff and volunteer(s) in the summer of 2005. This data must be collected in the snow free season, however there may be increased unauthorized use during the fall hunting season that is undetected. Evidence of prolonged unauthorized use would be detected in the next monitoring cycle. Observers drove all the roads in each of the areas and recorded locations and data at all visible closures. Data included GPS location, photo, type of closure, type of road surface, roadway characteristics and apparent effectiveness of the closure. If any evidence of vehicle use beyond a permanent closure or of travel around gates was noted, the closure was determined to be “ineffective”. Data is stored in the GIS Trails layer and in the INFRA data base (gates).

Evaluation and Conclusions:

Table 8: Road Closure Summary FY 2005

Type of Closure	Number Evaluated	Effective Closure	Percent Effective (this type)	Percent Effective (all closures)
Gate*	157	96	61	30
Bar or barricade	2	2	100	<1
Earthen Berm	102	52	51	17
Manufactured	2	1	50	<1
Natural	2	2	100	<1
Rock Berm	13	9	69	3
Snow Berm	0	NA	NA	NA
Vegetation	37	26	70	8
Total	315	188		60

*The effectiveness of 19 gates was undetermined largely because it was unclear to the observer when or what type of vehicle traffic was allowed. Further evaluation at these sites will occur.

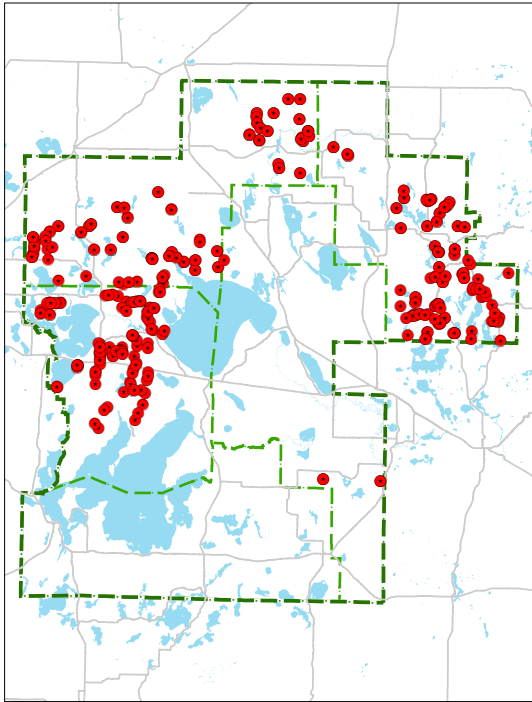


Figure 1: Road Closure Monitoring Sites CNF FY 2005

Of the closure types that were evaluated at 10 or more sites:

- vegetation (slash mats, logging debris or logs) has the highest effectiveness at 70%,
- rock berms were 69% effective,
- gates had an effectiveness of 61%,
- earthen berms are the most commonly recorded closures and are the least effective at 51%.

Evaluation:

Sixty percent of the road closures evaluated are effective. Forty percent are ineffective. Forest Plan standards and guidelines and project level decisions regarding road closure, decommissioning or obliteration do not allow for a margin of ineffectiveness. Roads that are closed should not have evidence of vehicle use.

This type of monitoring may somewhat under-estimate effective closures because if the road has been successfully closed for some period of time, it may not be visible to the field observers and is therefore not included in the data base. Still current road closure practices do not appear to be meeting Forest Plan objectives, guidelines or standards.

It is likely that no single type of closure is best suited for all sites. Further evaluation of road closures should help determine which closures are most effective at which sites and should help to modify Forest practices to increase the level of effectiveness.

Figure 2: Ineffective Road Closure showing ATV use over earthen berm.





Figure 3: Effective Road Closure using Slash Mat

Recommendations:

Closure monitoring should continue. Once a large enough baseline sample is available, some conclusions can be drawn as to which types of closures are most effective in various situations. The use of earthen berms for road closures should be re-evaluated. Building awareness of the difficulties in closing roads in a flat landscape should also continue.

The Forest Leadership Team visited road closure sites in FY 2005 and are currently developing a road closure/decommissioning strategy for the Forest. The Motorized Vehicle Use Map will be published in 2008. This map will clearly show the public where motorized use is allowed and where it is prohibited. This map will be used both as an educational and enforcement tool.

7. Wildlife: Management Indicator Species

Monitoring Question:

What are the population trends of management indicator species?

Monitoring Driver—Desired Condition and Objectives:

36 CFR 219.19(a)(6). Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies, to the extent practicable.

D-WL-3 Aquatic and terrestrial wildlife habitats and species populations, while constantly changing due to both management activities and naturally occurring events, are present in amounts, quality, distributions, and patterns so that NFS land:

- e. Provide for the desired quality and quantity of habitat for management indicator species and indicator habitats.

O-WL-1 Populations: Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for management indicator species and management indicator habitats.

O-WL-15 Promote the conservation and recovery of the bald eagle. Population goal minimum: 150 occupied breeding territories.

O-WL-16 Promote the conservation and recovery of the gray wolf. Population goal minimum: contribution to state-wide goal of 1250-1400.

O-WL-32 Provide habitat to provide for population goal minimum: 20-30 breeding pairs (Northern goshawk).

O-WL-33 Increase amount of white pine to amounts more representative of native plant communities by planting or naturally regenerating white pine trees in white pine forest types and in other upland deciduous, mixed, and conifer forest types. This objective matches white pine objectives shown in the Landscape Ecosystems Objectives section.

Background:

This resource area monitors and evaluates population trends of designated Management Indicator Species (MIS). Management Indicator Habitats (MIH) were also identified for the Chippewa National Forest and along with MIS will be used to analyze the potential effects of management practices on wildlife habitats and populations. The monitoring and evaluation of MIHs is scheduled to begin in 2006.

MIS are defined as species monitored over time to assess the effects of management activities on their populations and the populations of other species with similar habitat requirements (Forest Service Manual 2620.5). The rationale underlying the MIS concept is that by managing for and conserving the habitats in which MIS occur, other species that depend on these habitats would also be provided for. The Chippewa National Forest (CNF) has identified four MIS: gray wolf, bald eagle, northern goshawk and white pine. All four of these are species of high public interest; address major management issues; and can be practically monitored. Finally, the CNF and the other National Forests in the western Great Lakes region play a major role in contributing to the overall conservation of these species. Additionally, the

Gray wolf was selected as a management indicator species because:

- it is currently listed as a federally threatened species;
- the potential for impacts from National Forest management to affect its habitat, and existing opportunities to enhance wolf recovery efforts (FSM 2621.1); and
- the potential for management activities and human access/development to affect changes in wolf populations, prey habitat, and related prey species (deer, moose, and beaver).

Bald eagle was selected as a management indicator species because:

- it is currently listed as a federally threatened species;

- the potential for impacts from National Forest management to affect its habitat, and opportunities to enhance recovery efforts (FSM 2621.1);
- changes in eagle populations and habitat can indicate effects of management on other species requiring mature riparian forest; and
- it addresses major management issues related to riparian forests, large old trees and watershed health.

Northern goshawk was selected as a management indicator species because:

- population changes may indicate effects of management;
- it is a Region 9 Regional Forester's sensitive species;
- its habitat associations are well-documented in literature;
- it can function as an umbrella species – (its large area requirements and use of multiple habitats encompass habitat requirements of many other species); and
- its breeding productivity and population and habitat trends can be monitored at site and landscape level.

White pine is a high profile tree species in the forests of northern Minnesota and was selected as a management indicator species because:

- population changes are believed to indicate effects of forest management;
- it is a species with many social, economic and ecological values.
- it addresses major management issues about how much and where to promote white pine for its important wildlife habitat features, timber value, scenic quality and role in maintaining ecologically healthy forest composition and structure; and
- it is considered to be a keystone species, in that its overall effects on critical ecological processes and biodiversity are greater than would be predicted by its abundance.

The gray wolf and bald eagle were designated as MIS under the 1986 Land Management Plan for the CNF. As MIS, they have been monitored for the past 20 years. The northern goshawk and white pine are new MIS.

Monitoring Activities:

Gray wolf:

The Minnesota Department of Natural Resources (MN DNR) has monitored its statewide wolf population since the late 1970s. These surveys are expected to obtain data on wolf distribution and abundance in Minnesota. The survey approach used combines several sources of data and the methods remained relatively consistent over the 30-year period. Previous surveys have taken place at 10-year intervals (1978-79, 1988-89, and 1997-98). In anticipation of a federal de-listing proposal in 2004, another comprehensive wolf population and distribution survey was conducted during the winter of 2003-04. As with past comprehensive wolf surveys, the CNF contributed observation information to this survey.

The MN DNR mails out instructions, data forms, and maps to cooperating natural resource agencies and consultants including: MN DNR, USDA Forest Service, US Fish and Wildlife Service, USDA Wildlife Services, US Geological Survey, Tribal and Treaty Resource Authorities,

County Land Departments, Camp Ripley, Voyageurs National Park and forest products industries and consultants. Cooperating participants are asked to record a location and group size estimate for all wolf sign (visual, track, scat) observed during the course of their normal work duties from October 2003 through April 2004. The MN DNR then uses this information, along with other wolf and deer data, to compute the total wolf range and the total occupied range, as well as estimate the wolf population within the state of Minnesota (MN DNR, 2005). The MN DNR maintains and stores the data collected.

Bald eagle:

The Chippewa National Forest has been monitoring bald eagle populations within its proclamation boundary for over 30 years. Nesting activities are monitored by air. All known eagle nests within the CNF proclamation boundary are mapped and visited by fixed-wing airplane twice during the nesting season. An April activity flight is made to ascertain whether known nest areas are 1) occupied (eagles within the vicinity of a nest), 2) active (eagles on the nest or eggs visible), or 3) inactive (no eagles in the vicinity of the nest). All new nests detected along the flight path are recorded similarly and added to the list of known nest sites. A second productivity flight is made in July to all previously identified active nest sites. The number of eagle chicks in or around the nest is recorded for each site.

Data collected from past eagle flights on nest locations have been put on an ARCINFO GIS coverage. Most of this information has been migrated to FAUNA. Productivity data and new data will be input into FAUNA.

Northern goshawk:

Individual known goshawk nest sites occurring on the CNF have been monitored for approximately 10 years in order to determine if the nest structure still exists, the nest site is active, and the pair was successful at fledging young. This monitoring has been and continues to be an important aspect in assessing northern goshawk populations and habitat conditions on the CNF, in Minnesota and in the western Great Lakes region. The methodology of monitoring nesting activity and productivity at known nest sites consists of conducting specific survey activities at certain times of the season based on goshawk nesting chronology. The detection of nesting goshawks is fairly reliable because this species is highly responsive to conspecific alarm calls during the pre-incubation or courtship stage, when the nesting pair is establishing a nest. The methodology for detecting nesting goshawks has been described in the literature (Kennedy and Stahlecker 1993, Roberson 2001). More recently, Andersen et al. (2003) described the protocol they developed for monitoring goshawk breeding activity. Three types of surveys are conducted during the monitoring season: occupancy surveys, nesting surveys, and nesting success surveys.

- Occupancy surveys are conducted to detect whether goshawks are present within the territory. These surveys occur from early March through mid-April. They may include a combination of nest observation and broadcasting goshawk alarm calls at various distances within a 500m radius of all known nest sites within a particular breeding territory. Some follow-up occupancy surveys may occur in June.

- Nesting surveys are conducted for those breeding territories in which goshawk activity was detected during the occupancy surveys. The nesting surveys are conducted in late April or May during the incubation period. They consist of quietly entering an area where there is some reason to suspect activity, but where nesting activity had not been confirmed. The primary objective of this survey is to confirm nesting so that a territory can be classified as “Active”.
- Nesting success surveys consist of quietly entering the nest area and searching for chicks within all previously identified active nest sites. These surveys occur in June and July during the fledging period, in order to determine the final reproductive outcome at that nest. The area within 100 meters of the active nest is searched for chicks to determine whether the breeding outcome was a success or failure.

These surveys have been conducted by CNF and MN DNR personnel as well as goshawk researchers from the University of Minnesota. Recently, the known goshawk territories on the CNF have been monitored as part of the Northern Goshawk Monitoring Project undertaken by the MN DNR non-game program. This project has been on-going since 2003 and its primary objective is to assess occupancy and productivity of known goshawk territories in northern Minnesota. This productivity data is stored, maintained, and shared with other agencies by MN DNR.

Nest locations on the CNF were put on an ARCINFO GIS coverage and are being migrated to the FAUNA database.

Evaluation and Conclusions:

Gray wolf:

Wolf populations in the western Great Lakes have exceeded federal recovery goals for numerous years. This information has led to recent proposals to remove the species from federal listing. In recent years, there has been a gradual, long-term increase in wolves in Minnesota. Although the Chippewa is not considered to be critical habitat for the wolf it does contribute a considerable amount of suitable habitat and numbers of wolves to the totals for Minnesota. Therefore, it plays an important role in maintaining and sustaining wolf populations above the recovery goals.

For the first time since consistent surveys were initiated in the late 1970s, total wolf range in Minnesota did not increase, and estimated occupied range declined only slightly. The current population size estimate is larger than in 1997-98; however, confidence intervals for the last two population estimates are largely widely overlapping. The MN DNR concludes that there has been no significant change in the distribution or abundance of wolves in Minnesota since 1997. At that time, the survey assessment estimated 2,450 wolves ranging over 33,970 square miles of the state. This current wolf population estimate far exceeds the state-wide goal of 1250-1400 wolves. Details of survey methods, results and discussions can be found in the MN DNR report entitled “Distribution and Abundance of Wolves In Minnesota, 2003-04” authored by Erb and Benson.

Bald eagle:

For the period from 1987 thru 2004 (18 years), Chippewa bald eagle monitoring shows an average of: 151 (range, 88-189) active breeding pairs; 96 successful breeding pairs (range, 66-108); and 1.02 young fledged per active nest (range, 0.76-1.39).

Activity and productivity flights were conducted for bald eagle surveys in FY 2005. A total of 351 nests were surveyed. Of these, 135 nests were active meaning that there were visible eggs or an incubating adult on the nest. Of these 135 active nests, 48 of them were successful in raising at least one chick to the fledgling stage. A total of 55 eagle chicks were observed during the productivity flights, 0.41 young fledged per active nest.

Although the total number of active eagle nests are similar to those encountered in the past, the number of successful nests and the number of fledged young per active nest is considerably below those recorded in the past. It is difficult to determine whether or not to attribute this to observer differences, timing of the flight, weather conditions during the nesting period or just a biological aberration for that year. While the increasing competition among breeding pairs at higher nesting densities is thought to be the primary factor in breeding success declines, there may be a need for further analysis of this aspect of eagle population dynamics. This may result in a somewhat different monitoring strategy geared toward more focused population sampling in portions of the Forest with varying eagle nesting densities.

Bald eagle activity and productivity flights are planned to occur again in 2007.

Northern goshawk:

Over the past 10 years, the number of known goshawk breeding territories has risen steadily on the CNF, from 9 known in 1996 to 39 known in 2005. This is generally believed to be a product of increased activity in goshawk habitat and a higher interest in monitoring goshawk populations, nesting activities and habitat conditions in northern Minnesota. The number of known active breeding territories and the number of successful breeding pairs has more than doubled, from 7 active breeding territories in 1996 to 17 in 2005 and 3 successful breeding pairs to 8 over the same time period. However, these latter two aspects of breeding territory information do not show the same corresponding increase to that exhibited by the number of known breeding territories on the CNF. The table below provides breeding territory information for four points in time over the past ten years.

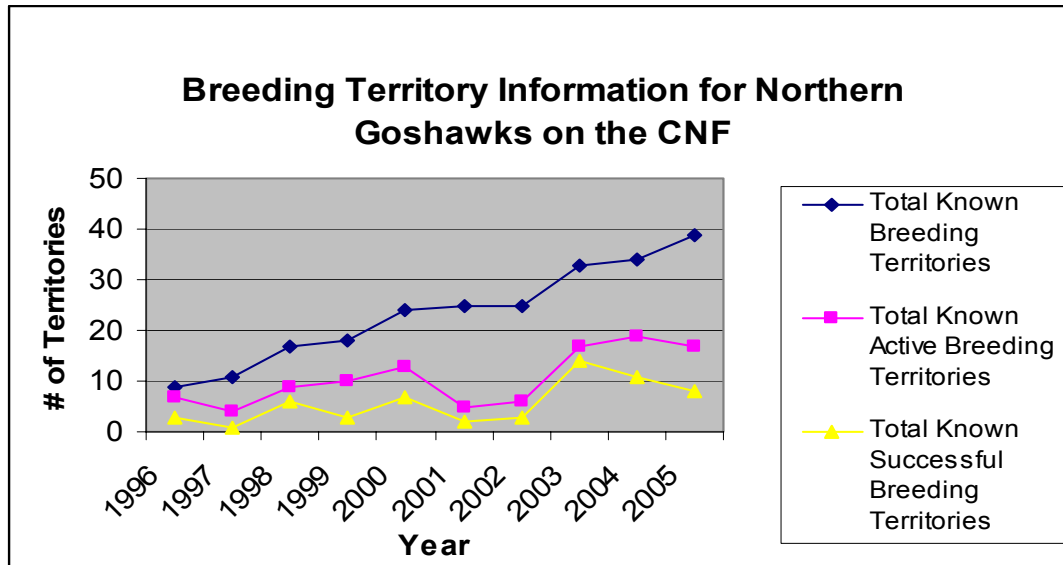


Figure 4: Goshawk Breeding Territory Information

The population dynamics of the goshawk in northern Minnesota are not clearly understood at this time. The data provided is primarily based upon goshawk territories discovered during on-going field operations on the CNF. Therefore, there may be some bias in how territories are found, the habitats they are found in and the results of their subsequent monitoring efforts. To more completely understand any long term monitoring data, there needs to be some level of randomized inventory of suitable nesting/breeding habitats.

The CNF Forest Plan includes an objective of sustaining 20-30 breeding pairs of northern goshawks. Based upon current direction in the Forest Plan, the number of breeding pairs and suitable habitat conditions are expected to increase. Future monitoring at both the nest site and landscape scales will confirm this expectation.

Recommendations:

These MIS will need to be monitored on an annual basis. Additionally, each species should be evaluated in terms of the Management Indicator Habitats they inhabit and the Forest Plan direction provided for them. The CNF should continue to cooperate with the MN DNR on its comprehensive wolf surveys. It should also continue to assist with the MN DNR goshawk monitoring project by contributing to its northern Minnesota nest monitoring efforts.

Literature cited:

Andersen, D.E., C.W. Boal, and M.J. Solensky. 2003. Northern goshawk nesting survey in northern Minnesota. Preliminary Project Report, 30 June 2003. Minnesota Cooperative Fish and Wildlife Research Unit, St. Paul, Minnesota, 55108.

Kennedy, P.L. and D.W. Stahlecker. 1993. Responsiveness of nesting northern goshawks to taped broadcasts of 3 conspecific calls. *Journal of Wildlife Management* 63:511-516.

Minnesota Department of Natural Resources, Erb and Benson 2005. Distribution and Abundance of Wolves in Minnesota, 2003-04. MN Department of Natural Resources, St. Paul, MN.

Roberson, A.M. 2001. Evaluating and developing survey techniques using broadcast conspecific calls for northern goshawks in Minnesota. M.S. Thesis, University of Minnesota, Department of Fisheries, Wildlife, and Conservation Biology. St. Paul, MN, 55108.

8. Wildlife: Management Indicator Species

Monitoring Question:

To what extent is Forest management moving toward short term (10-15 years) and long term (100 years) objectives for habitat conditions for management indicator species (MIS) and species associated with management indicator habitats.

Monitoring Driver—Desired Condition and Objectives:

D-WL-3 Aquatic and terrestrial wildlife habitats and species populations, while constantly changing due to both management activities and naturally occurring events, are present in amounts, quality, distributions, and patterns so that NFS land:

- e. Provide for the desired quality and quantity of habitat for management indicator species and indicator habitats.

O-WL-1 Populations: Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for management indicator species and management indicator habitats.

O-WL- Habitats: Move terrestrial and aquatic habitats in the direction of desired conditions and objectives for all native and desired non-native wildlife.

Background:

The Natural Resources Research Institute has been monitoring forest birds on the Chippewa since 1991. This project is facilitated through a Challenge Cost-Share Agreement between the University of Minnesota Natural Resource Research Institute and the US Forest Service (Chippewa, Chequamegon-Nicolet and Superior National Forests).

Many of the bird species monitored through this project are directly tied to the Management Indicator Habitats (MIHs) in the Forest Plan and Final Environmental Impact Statement. Additionally, the data and information generated by this project assists in the analyses of the forest birds on the Regional Forester's Sensitive Species list, the high priority birds identified through

Partners in Flight, and other bird species of special interest, such as the golden-winged warbler. The monitoring data collected through this project was used to monitor and evaluate several forest birds identified as MIS under the 1986 Forest Plan.

Monitoring Activities:

A long-term forest bird monitoring program was initiated by Natural Resources Research Institute (University of Minnesota, Duluth), the U.S. Forest Service, the Minnesota Department of Natural Resources, and other cooperators on the Superior and Chippewa National Forests in 1991 and the Chequamegon National Forest in 1992 (Lind et al. 2004). The objectives of the program include documenting trends in abundance for forest birds during the breeding season and describing bird/habitat relationships on the national forests.

More than 1,250 points are sampled annually on 132, 134, and 164 stands on the Chequamegon, Chippewa, and Superior National Forests, respectively. Stands are large enough to accommodate three sampling points a minimum of 220 meters apart. Sampling locations are distributed across the forest mosaic in a stratified random manner in each national forest. Sample points are open to natural and human disturbance. Ten-minute, 100 m radius point counts are conducted each year during June or early July by trained and experienced surveyors. For each species, yearly relative abundance indices were calculated using birds detected within 100 m of each point. Relative abundance indices for species from the three national forests were calculated. Trends were then calculated on each national forest and the three forests pooled for the entire sampling period, as well as two time periods; 1991 (1992 in the Chequamegon NF) to 1998 and 1998 to 2005. One of the main goals of this monitoring program is to identify potential declines of forest bird species. This is especially true for species of conservation concern such as the Eastern Wood-Pewee, Winter Wren, Hermit Thrush, Ovenbird, and White-throated Sparrow. Additional details regarding sample design, methodology, and statistical analyses can be found in Hanowski and Niemi (1995) and Lind et al. (2005).

NRRI stores and manages the data collected. Annual reports with statistics are sent to the forests. Information can be found on their website: <http://www.nrri.umn.edu/mnbirds/>. Data from the CNF is also being input into the FAUNA database.

Evaluation and Conclusions:

Trends in relative abundance were calculated for 69 bird species, including 57 species in the Chequamegon NF, 55 in the Chippewa NF, and 46 in the Superior NF. Thirty-nine species were also tested for a pooled trend by combining data from the three national forests. A total of 158 species/national forest trends were calculated in 2005 (not including pooled trends), 61 (39%) of which were significant ($P \leq 0.05$).

Twenty species increased significantly in at least one national forest and 23 species decreased. Eight species had significant increasing pooled trends and 13 had decreasing trends. The percentage of increasing species on each national forest ranged from 7% in the Chequamegon NF, to 22% in the Superior NF. The percentage of decreasing species ranged from 18% in the Chippewa NF to 26% in the Chequamegon NF. The short-distance migrant guild showed highly significant declines on all national forests. Long-distance migrants declined in the Chequamegon

and Superior NF and increased in the Chippewa NF. Permanent residents increased on the Chippewa and Superior NF and were stable on the Chequamegon NF. The ground nesting guild declined on all national forests, while shrub/sub-canopy nesters increased on all national forests. The canopy and cavity nesting guilds showed stable trends, except for a decrease in canopy nesters in the Chequamegon NF and an increase in cavity nesters in the Superior NF.

The deciduous and mixes forest bird guilds declined on the Chequamegon and Superior NFs and the pooled NFs. The lowland coniferous forest bird guild declined on the Chippewa NF and the pooled NFs. The early-successional bird guild increased on the Chippewa and the upland coniferous guild increased on the Superior NF. Evidence from recent regional studies have demonstrated greater nest predation rates on ground nests near forest/clearcut edges, as well as a significant increase in the creation of forest edges in recent years. Increasing amounts of forest edge and nest predation may be having negative effects on declining ground-nesters such as the Winter Wren, Veery, Hermit Thrush, Ovenbird, and White-throated Sparrow.

Of the 1274 survey sites on the three national forests, 14.2% have been at least partially harvested since the beginning of monitoring, which is about 1% a year. This harvest rate is comparable to the 4.8% change from mature forest to early-successional types on federally managed forest lands in northeastern Minnesota between 1990 and 1995 (i.e. ~1% annual change). Thus, it appears that management activities on our sample sites are representative of the national forests as a whole, and that the trends we are documenting are probably occurring across the regional landscape.

The information derived from this long-term forest bird monitoring can now be related to forest habitat conditions on the Chippewa and to particular Management Indicator Habitats. With each year of data collection and analysis, we receive a better understanding of the link between forest breeding bird populations and their habitats on the Chippewa.

Recommendations:

We need to continue this partnership and strive to relate the data to Management Indicator Habitats in the next Monitoring and Evaluation Report.

Literature cited:

- Hanowski, J. M., and G. J. Niemi. 1995. Experimental design considerations for establishing an off-road, habitat specific bird monitoring program using point counts. Pages 145-150 in Monitoring bird populations by point counts. General Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, Albany, CA.
- Lind, J., N. Danz, J.M. Hanowski, and G.J. Niemi. 2005. Breeding bird monitoring in Great Lakes National Forests: 1991-2005. Natural Resources Research Institute Technical Report: NRRI/TR-2006/xx. (available at <http://www.nrri.umn.edu/mnbirds/reports.htm>)

9. Wildlife: Non-native Invasive Species (Earthworms)

Monitoring Question:

To what extent is Forest management contributing or responding to populations of terrestrial or aquatic non-native species that threaten native ecosystems?

Monitoring Driver—Desired Condition and Objectives:

D-WL-9: Native plants and animals dominate all terrestrial and aquatic ecosystems, with non-native plants and animals forming, at most, a minor component.

O-WL-38 Reduce the spread of terrestrial or aquatic non-native invasive species that pose a risk to native ecosystems.

O-WL-39 Use Integrated Pest Management to:

- a. Eradicate any populations of new invaders
- b. Contain or eradicate populations of recent invaders (*i.e.*, non-native invasive species that have only recently become established but are not widespread in the planning area)
- c. Limit the spread of widespread, established invaders within the planning area

Background:

For over 12,000 years Minnesota's forests developed without the influence of earthworms. If North America earthworm species ever inhabited Minnesota, they were extirpated during the last glaciation. Without earthworms, forests' fallen leaves accumulated and developed a thick duff layer that provided an excellent rooting zone for herbs and tree seedlings. Currently, over fifteen species of European earthworms inhabit Minnesota. Over the last 150 years European earthworms were likely accidentally and intentionally introduced with the importation of plant material and soils from Europe and the use of worms as fishing bait across the region. Ongoing studies suggest that invasive European earthworms have a notable effect on forest understory plant diversity and composition, nutrient cycling, and soil properties. Since the 1980's, forest managers on the Chippewa National Forest have been concerned about the loss of understory plant cover and diversity in areas with high earthworm populations. Exotic earthworms are considered a major factor in the population decline of the state threatened



goblin fern (*Botrychium mormo*). Very little is known about the distribution of different earthworm species in Minnesota forests and the extent of impacts they may be having on forest plant communities. Also, it is not known why some forests seem to lose their forest floors, herbs and tree seedlings in response to earthworm invasion, while others do not. (Frelich, L.E. and A.R. Holdsworth. 2002.)

While studies have been conducted on the effects of earthworms on the Forest (Frelich, L.E. and A.R. Holdsworth. 2002 , Hale, et al 2005), this is the first year that earthworm inventories were included along with our sensitive plant surveys. Over time this information will be used as a baseline to determine the impacts of earthworm invasion including the effects, if any, Forest management may have, the effects of earthworms on sensitive plants, and the areas of highest probability for earthworm invasion across the Forest. The data collected is stored locally in an ArcView shapefile with its attribute table. At this time, it doesn't appear that any of the corporate databases are designed to house this type of data.

Monitoring Activities:

In FY 2005, the Forest Monitoring, Inventory and Survey Team conducted sensitive plant surveys in 498 stands. Information on the presence, absence and extent of earthworms was included in the survey. Observers also noted the earthworm growth stage and recorded comments on such things as duff depth and apparent physical characteristics of the soil. Stands selected for survey are those with potential for management activities; primarily harvest or silvicultural treatment, but also including fire fuels treatments, special uses, minerals extraction, and habitat management. Stand selection is not based on the likelihood of earthworm presence.

Evaluation and Conclusions:

The threat of non-native invasive species has been identified as one of the top four threats to national forest land. Because they lack pathogens and predators, some invasives have become persistent, aggressive invaders of disturbed habitats and native plant communities. They may become the dominant disturbance component, thus reducing native plant diversity, threatening sensitive species and impacting wildlife habitat.

At this time, the full extent of earthworm invasion on the Forest is unknown. Combining earthworm observations with the sensitive plant surveys that are already being conducted is a very cost effective way to begin assessing the problem.

Table 9: Earthworm Surveys Chippewa National Forest FY 2005

Forest Type	Forest Type #s	# stands surveyed	Impacted	Severely Impacted
Pine	01,02,03	86	22	5
Spruce/Fir	11,12,16	28	7	1
Lowland Conifer	14,15,18,19	27	2	1
Northern Hardwood	55,71,82,85,89	87	21	11
Aspen/Birch	91,92,94,95	201	54	19
Open/Brush	98,99	69	0-1	1
Totals (%)		498 (100)	107 (21)	38 (8)

A total of 498 stands were surveyed in FY 2005. Of these, 107 stands were impacted by earthworms, an additional 38 stands were severely impacted and 353 were not impacted.

While most studies have focused on the impacts of earthworms in northern hardwood forest types, any upland forested community may be impacted by earthworms.

Recommendations:

Monitoring of earthworms should continue until an adequate baseline is available. Then this information may be used to draw correlations between presence of earthworms and other parameters such as the proximity to lakes, lake accesses, or ATV trails, the abundance of threatened and sensitive plants, and the resilience of the native plant community. The information will also be used to prioritize areas for containment and for public education.

This data will be shared with researchers from the University of Minnesota who are currently studying the extent and impacts of earthworm invasion on Minnesota Forests. The Forest should continue to work with partners on public education regarding the effects of earthworms and their role in containing the spread of non-native invasive species.

Cindy M. Hale, Lee E. Frelich,¹ Peter B. Reich,¹ and John Pastor². 2005. Effects of European Earthworm Invasion on Soil Characteristics in Northern Hardwood Forests of Minnesota, USA. *Ecosystems* (2005) 8: 911–927.

Frelich, L.E. and A.R. Holdsworth. 2002. Exotic earthworms in Minnesota hardwood forests: an investigation of earthworm distribution, understory plant communities, and forest floor dynamics in northern hardwood forests. Final report submitted to the Department of Natural Resources. 15 pp. MNDNR St. Paul, MN

10. Timber

Monitoring Question:

Are harvested lands adequately restocked after five years?

Monitoring Driver:

(36 CFR 219.12(k)[5][i]. Lands are adequately restocked as specified in the forest plan.

Background:

National Forest Management Act (NFMA) regulations require that cutover lands be adequately restocked within five years. Stocking surveys on regenerated stands are conducted the first five years after harvest to assess stocking levels. Regeneration may occur naturally or by planting or seeding.

This was also a monitoring element under 1986 Forest Plan and was included in past Monitoring and Evaluation Reports.

Monitoring Activities:

Stocking surveys were conducted on 2,944 acres across the forest in FY 2005. A stand may be surveyed more than once before it determined that stocking is adequate. Generally it takes several years for stands to become established. Once established and adequately stocked, stands can be certified. For naturally regenerated stands, certification may occur three years after site preparation. For plantations, certification usually occurs five years later. Where stocking is inadequate, as specified in the Forest Plan (Table S-TM-4, p 2-19), then follow-up activities are prescribed that may include additional site preparation and/or possibly planting.

Scheduling of surveys occurs using the FACTS database. Survey and certification accomplishments are also reported in FACTS. Survey data collected is loaded into FSVEG.

Evaluation and Conclusions:

In FY 2005, 1,385 acres of land were certified as satisfactorily stocked. Table 10 displays the classifications of these certifications.

Table 10: *Certifications Summary for FY 2005*

Type of Regeneration	Acres
Natural Regeneration with Site Preparation	1,044
Planted areas	268
Seeded areas	73

11. Insects and Disease

Monitoring Question:

Are insects and diseases populations compatible with objectives for restoring or maintaining healthy forest conditions?

Monitoring Driver—Desired Condition and Objectives:

(36 CFR 219.12(k)[5][iv]. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.

D-ID-3 Native insects and diseases are present and fulfilling their ecosystem function. Epidemics, when they occur, do not last longer than would be expected in a healthy ecosystem.

O-ID-1 Increase the amount of forest restored to or maintained in a healthy condition to with reduced risk of and damage from fires, insects, and diseases.

D-VG-5 Vegetation constantly changes through management activities and through naturally occurring disturbances and ecosystem recovery processes such as wind, fire, flooding, insects, disease, and vegetation succession. These fluctuations are within an ecologically and socially acceptable range of variability.

D-VG-8 The ecological processes of native vegetation communities are maintained, emulated, or restored at multiple landscape scales to provide representation of their natural range of distribution and variation within context of multiple-use goals and ecosystem sustainability. These include: processes such as disturbance from fire, wind, flooding, insects and disease; biological community and species interactions; nutrient cycling; and vegetation succession.

O-VG-11 Increase amount of a variety of prescribed burning practices to restore the ecological process of fire and provide habitat for threatened and endangered species and other wildlife that benefit from or require burned vegetation.

O-VG-12 Retain an adequate representation of naturally disturbed forest that is not salvaged, such as burned, flooded, blowdown, or insect- or disease-killed areas. Maintain these in a variety of patch sizes and distributions on the landscape.

O-VG-13 Where natural disturbances, human influences, or stand age or composition have combined to perpetuate stands that are brush-dominated or have sparse tree canopy on sites that could otherwise provide productive timber management opportunities, and where there may be adequate ecological representation of these types of conditions, seek to re-establish adequately stocked stands to address timber management objectives.

Background:

Insect and disease populations and trends were monitored and reported annually under the 1986 Forest Plan. Past Monitoring and Evaluation Reports discuss agents, changes in populations and the need for management actions. The 2004 Forest Plan also identifies this as an annual item to be monitored and reported.

Monitoring Activities:

Each year in July the Minnesota Department of Natural Resources (DNR) conducts aerial surveys to monitor forest health. This aerial survey is used to monitor the most apparent effects of damage agents to forest health. Supporting information can be found on the DNR Forest Health website: http://www.dnr.state.mn.us/treecare/forest_health/index.html.

Evaluation and Conclusions:

The FY 2005 survey results for the Chippewa National Forest are summarized in Table 11. A corresponding map showing locations of damage is displayed in Figure 5.

Table 11: Summary Results of DNR aerial forest health survey, FY 2005.

AGENT NAME	NUMBER OF STANDS	TOTAL APPROXIMATE ACRES
Abiotic	20	912
Flooding	5	258
Jack pine budworm	23	1,368
Larch casebearer	4	351
Porcupine damage	1	2
Two-lined chestnut borer	4	341
Unknown	5	198

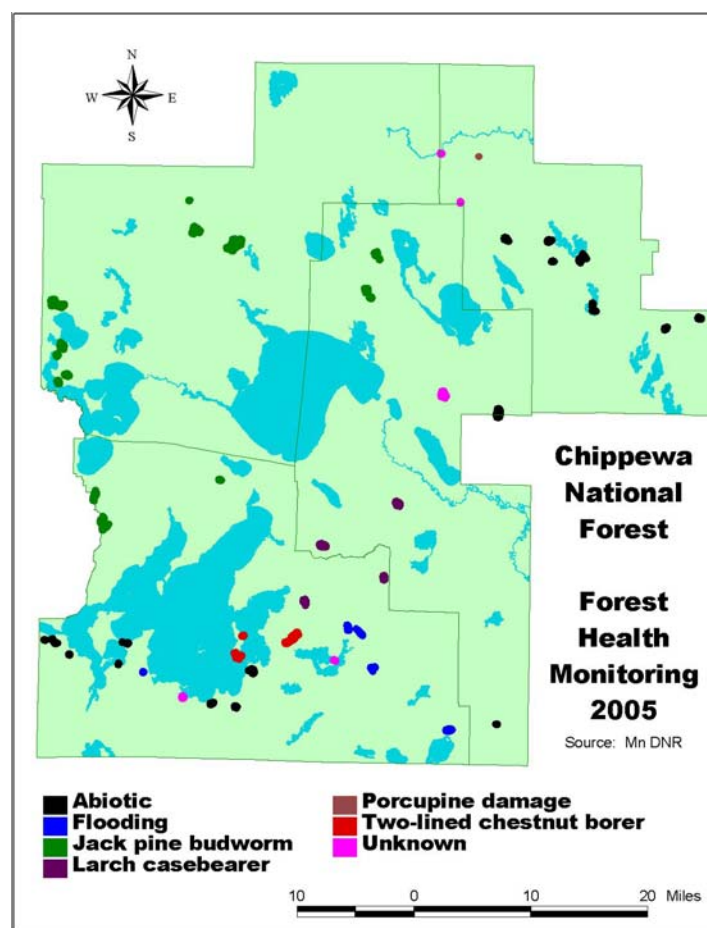


Figure 5: Locations of Damage in 2005.

Jack pine budworm:

Jack pine budworm (JPBW) has affected Jack pine in Minnesota throughout its range for the past several years. The upswing in populations is a natural cycle of this native defoliator. In 2004, Jack pine budworm reached the western edge of the Chippewa National Forest with approximately 274 acres being affected. These stands were all located around the Pike Bay area. In FY 2005, 1,368 acres were detected by the same aerial survey run to the Minnesota DNR (see Figure 4 for locations).

JPBW Egg mass surveys were done in FY 2005 by Northeastern Area State & Private Forestry, Saint Paul Field Office. These were conducted at the end of October. The results are displayed in Table 12.

Table 12: JPBW egg mass survey results.

Comp	Stand	No. Egg Masses	JPBW Evidence
40	12	2	yes
98	4	1	yes
27	22	0	yes
50	11	0	yes
50	25	0	yes
50	20	0	yes
46	10	0	no
48	32	0	no
136	4	0	no
137	8	0	no
31	29	0	no
69	38	0	no
114	99	0	no
99	38	0	no
80	11	0	no
99	18	0	no
80	54	0	no
99	4	0	no
70	19	0	no

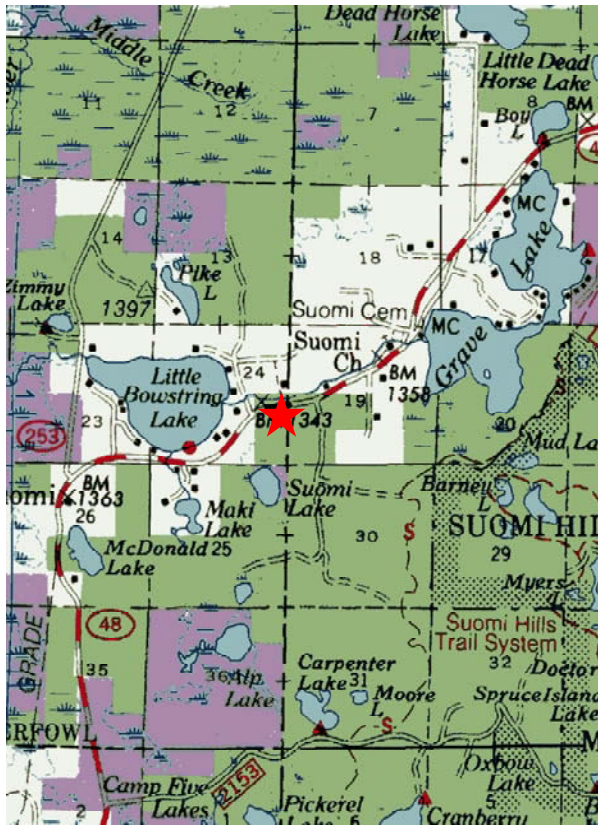


Figure 6: Red star indicates location where a male Gypsy Moth was trapped.

Only a few egg masses were found. It does not appear that defoliation levels will cause any significant decline in these stands in 2006. Populations of JPBW are expected to decline after 2005 based on the natural cycle of the insect and the results of egg mass surveys.

Gypsy Moth:

In 2003, Minnesota Department of Agriculture (MDA) and USDA-APHIS set 519 Gypsy Moth traps within the Chippewa National Forest and one single male moth was recovered. In 2004, the Minnesota Department of Agriculture delimited trapping (high density trapping) around this single find from the previous year. Traps were set at a density of 16 traps per square mile for the first mile out from the location, with the second surrounding mile having a density of 9 traps per square mile

The results of this 2004 trapping was negative, with no moths being recovered. No other Gypsy Moth traps were set on the Forest in 2004 due to a rotating grid schedule.

In 2005, delimited trapping was again conducted around this same site with no moths being recovered. A total of 90 traps were set *on the Forest* in 2005, including those that were part of the delimited trapping. Other areas around the Forest, not on the Forest, were also set. Trapping at mills is routine. Two mills sites were trapped; Etter Timber and Lumber at Talmoon and Valley Forest Resources at Marcell. Blandin in Grand Rapids is always trapped as they import wood from quarantined areas. No Gypsy Moths were trapped on or near the Forest in 2005.

Most of the Forest will be trapped in 2006 at a density of 1 trap/2 sq. miles. MDA is estimating around 600 traps would be set on the Chippewa in CY 2006.

Recommendations:

At this time, surveys, trapping results, and on the ground visits do not indicate upswings in population trends that warrant management concern or actions.

12. Fire

Monitoring Question:

How, where, and to what extent will prescribed fire be used to maintain desired fuel levels, and/or mimic natural processes, and/or maintain/ improve vegetation conditions, and/or restore natural processes and functions to ecosystems?

Monitoring Driver—Desired Condition and Objectives:

D-ID-4 Accumulations of natural and activity fuels are treated to enhance ecosystem resiliency and to maintain desired fuel levels.

D-ID-5 Fire is present on the landscape, restoring or maintaining desirable attributes, processes, and functions of natural communities.

O-ID-2 Establish, maintain, or improve the condition of vegetation conditions using prescribed fire, mechanical treatments, and other tools.

O-ID-4 Reduce fuels and control vegetation in the understory of stands that have historically had naturally occurring low intensity surface fires.

O-ID-5 Provide a program where firefighter and public safety are the highest priority with every fire management activity.

Background:

Throughout the 20th century, fire management policy has continued to evolve in response to land and resource management needs, growing knowledge of the natural role of fire, and increased effectiveness of fire suppression. During the earliest years of wildland fire management (i.e. 1940s), the existing state of knowledge indicated that aggressive, total suppression was the best solution to limit widespread, damaging fires. As knowledge, understanding, and experience expanded, it became apparent that complete fire exclusion was not the best management direction to support a balanced resource management program. This has led to the development of current Forest Service fire policy. There is concern that increased fuel loading across the forest will lead to an increasing risk of large wildfires occurring within the wildland/urban interface areas. Currently, timber harvesting is the primary management tool used to meet ecological objectives on each forest. However, fire provides an additional tool for mimicking natural processes and disturbance. There are different effects on resources when using fire versus timber management as a tool to achieve ecological objectives. Fire contributes to a host of functions and processes in ecosystems. Fire reduces accumulations of organic material, which in turn reduces wildfire hazard. It recycles nutrients and alters soil chemistry, aids in decomposition, and influences soil structure and stability. Fire effects can vary depending on fire intensity, severity, and frequency, the primary factors that define fire regimes.

Prior to the revision of the 1986 Forest Plan there was little use of fire to meet ecological objectives on the Chippewa NF. However the use of fire for site preparation or fuels reduction has

been increasing over the last several years. The 2004 Forest Plan includes more of an emphasis on fire as a tool for site preparation, fuels reduction and restoration.

Monitoring Activities:

Monitoring was conducted pre and post-burn to determine if the prescribed fire treatment had met the pre-determined management objectives. This was an underburn to remove fuel build up from the forest floor, retard shrub growth, prepare a seedbed for natural regeneration, and create light mortality in the overstory.

The range of acceptable results were pre-determined and included:

- Exposing up to 10% of the area to mineral soil
- Removing 85% or more of 1 hour fuels
- Removing 50% or more of 10 hour fuels
- Top killing 50% or more of emerging brush and hardwood regeneration
- Holding mortality of remaining overstory trees to less than 10%

The prescribed (Rx) burn was conducted on May 5, 2005. Burn operations went extremely well. Fuel Load data was collected using the FIREMON protocol (based on Brown's Transect) and ocular estimates. Pretreatment plots were measured on 4/13/05 and re-measured on 5/6/2005, the day after the burn.

Evaluation and Conclusions:

Expose up to 10% of the area to mineral soil – results acceptable.

Areas in proximity to jackpot fuels and heavier fuels were burned to the point of mineral soil exposure – overall less than 10% but near the objective.

Remove 85% or more of 1 hour fuels – results acceptable.

Evidenced by the data collected from FIREMON fuel load transect.

Pretreatment = .12 tons/acre. Post-treatment remeasure = 0.0 tons/acre (total consumption of 1 hr fuels)

Remove 50% or more of 10 hour fuels – results acceptable.

Evidenced by the data collected from fuel load transect.

Pretreatment = 1.46 tons/acre. Post-treatment remeasure = .28 tons/acre
(80% reduction of 10 hour fuels).

Top Kill 50% or more of emerging brush and hardwood regeneration – results acceptable.

Evidenced by the data collected from fuel load transect.

Pretreatment = .75 tons/acre. Post-treatment remeasure = .12 tons/acre

(84% reduction of shrub cover, expressed in tons/acre)

(83% reduction of shrub cover by percent of cover)

Site visit on 6/6/05 – excellent stem kill on brush and hardwood stems.

Hold mortality of remaining overstory trees to less than 10% - results acceptable.

Ocular estimate--While many of the trees have scorch heights on average 20 feet, the cambium appears to be undamaged.

Many trees also have “browned out” needles in the canopy (some in excess of 70% of the crown, average of 35-50%). Mortality from canopy heat will not be evident until the next growing season (summer 2006). It is expected that most trees will recover based on observations from previously burned units.

Table 13: *Additional Monitoring Information collected not directly related to objectives*

Parameter	Pretreatment	Post Treatment
Duff Layer (inches)	2.3	2.0 (-13%)
Litter Layer (inches)	1.2	0 (-100%)
Duff +Litter (inches)	3.5	2.0 (-42%)
Duff Biomass (tons/acre)	22.8	20.7 (-12%)
Litter Biomass (tons/acre)	6.1	.1 (-98%)



Figure 7a :Unit 7 Pre-burn



Figure 7b: Unit 7 Burn



Figure 7c: Unit 7 Post Burn

Recommendations:

This prescribed fire project had specific, pre-determined objectives. It was clear what the purpose of the fire was and what outcomes and thresholds were desired or expected. This is a critical component of a successful burn project and should be incorporated into every prescribed fire project. The project appears to have met objectives. Future monitoring at the site or in adjacent units should be conducted to determine overstory mortality over time.

Data collection for fire effects monitoring is not consistent across the Forest. Efforts should be made to gain consistency in monitoring so that available data can be aggregated and analyzed more efficiently.

13. Tribal Rights and Interests

Monitoring Question:

The Forest Plan states three conditions to be monitored:

- Is Forest management helping to sustain American Indians' way of life, cultural integrity, social cohesion, and economic well being?
- Is the Forest facilitating the right of the Tribe to hunt, fish, and gather as retained via treaty?
- Are government to government relationships functional?

Monitoring Drivers:

D-TR-1 Lands within the Forest serve to help sustain American Indians' way of life, cultural integrity, social cohesion, and economic well-being.

D-TR-2 The Forest Service continues to work within the context of a respectful government-to-government relationship with Tribes, especially in areas of treaty interest, rights, traditional and cultural resources, and ecosystem integrity. The Forests provide opportunities for traditional American Indian land uses and resources.

D-TR-3 The Chippewa National Forest facilitates the exercise of the right to hunt, fish, and gather as retained by Ojibwe whose homelands were subject to treaty in 1855 (10 Stat. 1165). Ongoing opportunities for such use and constraints necessary for resource protection are reviewed and determined in consultation with the Leech Lake Band of Ojibwe.

O-TR-1 Improve relationships with American Indian tribes in order to understand and incorporate tribal cultural resources, values, needs, interests, and expectations in forest management and develop and maintain cooperative partnership projects where there are shared goals.

O-TR-2 Maintain a consistent and mutually acceptable approach to government-to-government consultation that provides for effective Tribal participation and facilitates the integration of tribal interests and concerns into the decision-making process.

O-TR-3 The Forest Service will work with the appropriate tribal governments to clarify questions regarding the use and protection of miscellaneous forest products with the objective of planning for and allowing the continued free personal use of these products by band members within the sustainable limits of the resources.

O-TR-4 Consult, as provided for by law, with Tribes in order to address tribal issues of interest and National Forest management activities and site-specific proposals.

Background:

This is a new element that is being monitored with the 2004 Forest Plan. The Leech Lake Reservation is within the boundary of the Chippewa National Forest.

The Chippewa National Forest has a role in maintaining rights preserved by treaties because it is

an office of the federal government responsible for natural resource management on land subject to these treaties. Government to government consultation is ongoing between the Forest Service and the Leech Lake Band of Ojibwe (LLBO) who were signatory to the Treaty of 1855, however monitoring the status or progress of this consultation is new. A Memorandum of Understanding (MOU) between the Forest and the Band also speaks to cooperation and forming management partnerships together. The Forest Plan directs implementation of the MOU by providing goals, objectives, standards and guidelines on consultation and interaction between the Forest and the Band. The previous Forest Plan (1986) did not specifically address the relationship, treaties or monitoring of activities that affect the Band.

Tribal Resolution 00-80 authorizes the Director of Leech Lake Division of Resource Management to be the official representative and primary contact in all US Forest Service matters. In a letter to the Band in 2003, Under Secretary for Natural Resources, Mark Rey, committed the Forest Supervisor as the point of contact for government to government relations in lieu of a designated Tribal Liaison.

Monitoring Activities:

The Forest conducted the following activities in conjunction with project planning and implementation:

- Quarterly meetings with the Band's Division of Resource Management director to identify issues and move forward those where agreement exists.
- Contacting Local Indian Councils (15 exist) to discuss future planning and current implementation efforts and identify any historic sites or traditional uses within the project areas, or concerns with the projects.
- Providing a unique Traditional Resource Inventory program involving formal collection of information related to Traditional Cultural Properties. A GIS database is now available for use in project planning.
- Ongoing formal archeological surveys. Beginning in 1986, the Forest helped train LLBO staff to conduct these surveys. The Forest continues to contract that work through the Band.

In August 2005, the Chippewa Forest Leadership Team met with the Leech Lake Band Division Tribal Council to discuss the pattern of government to government interactions for FY 2006. Regular meetings between the Forest Supervisor and Director of Division of Resource Management were one method for assessing agency relations.

Evaluation and Conclusions:

During FY 2005, Forest staff began to keep better records of interactions with tribal government such as meeting dates to explain project proposals early in the process, issues raised or resolved during development of Environmental Assessments, or discussions between government-to-government officials. This background and feedback allows the Forest to better assess if the proposed indicators to measure sustaining and facilitating relationships, rights and American Indian well-being are the best indicators to measure. More refined records and use of them may

result in better project proposals in the future.

The Forest proposes to fill a Tribal Liaison position in 2006, potentially increasing the effectiveness of relationship-building and utilizing project feedback from several levels of tribal government.

Forest is developing a process and protocol that will provide more detailed information for the 2006 Monitoring and Evaluation Report.

14. Sand Plains Project and MFRC monitoring

Monitoring Question(s):

Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11(d).

Monitoring Driver—Desired Condition and Objectives:

A program of monitoring and evaluation shall be conducted that includes consideration of the effects of National Forest Management on land, resources, and communities adjacent to or near the National Forest being planned and the effects upon National Forest management from activities on nearby lands managed by other Federal or other government agencies or under the jurisdiction of local governments. (36 CFR 219.7(f)). Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11(d).

a. Sand Plains Project--Blueberry and Riparian Management Monitoring

The Decision Notice for the Sand Plain Environmental Assessment was signed in July 11, 2003 and included the objectives and mitigation measures relating to blueberry production and riparian areas listed below.

Background: *Blueberry Monitoring*

Objectives related to blueberry production included:

Use fire to enhance blueberry resources on approximately 321 acres.

Conduct shelterwood harvest on 33 acres in the red pine type as a preliminary treatment in order to begin establishment of a blueberry emphasis area.

Shelterwood harvest in 78 acres of jack pine stands where maintenance of an overstory, in combination with cultural activities in the understory, would promote blueberry production (78 acres).

Introduce fire into previously harvested stands of mixed jack pine and red pine where the jack pine was removed leaving low to moderately stocked red pine stands. The red pines are larger scattered or clumped trees that can withstand understory burning. Introducing

fire into these stands of would maintain fairly open stands with reduced brush competition, which should provide for good areas of blueberry production. Mechanical site prep may be used in combination with prescribed fire in some areas where necessary to maintain the openness of the stand.

Improve forest conditions to support traditional uses and subsistence gathering opportunities in the project area. Blueberry production would be enhanced.

Monitoring Activities: *Blueberry Monitoring*

In 2004, 224 plots were installed in four separate areas. Forest personnel counted each blueberry plant within the plots. Monitoring occurred in July of 2004 and 2005 when the plants are easily visible.

Evaluation and Conclusions: *Blueberry Monitoring*

Table 14: Blueberry Production in Sand Plains Area

	Pre Harvest 2004	Post-Harvest 2005
Total Blueberry Plants	40	25
Plots with blueberries	13	10

These stands have sandy soils with pine overstories and should be good sites for blueberry production. However there was not an abundance of plants to begin with and the numbers are declining. Both the number of blueberry plants and the number of plots with blueberries have decreased since harvest. Some of the loss was due to scarification damage that occurred during logging and mechanical site preparation. Other plants are being lost as brush encroaches into the stand. No burning has occurred to date and the brush, grass and forbs are quite dense and essentially smothering out the remaining blueberries and preventing establishment and spread of new plants.

The objective of increasing blueberry production has not been met in this area.

Recommendations: *Blueberry Monitoring*

The remaining post harvest activities, particularly prescribed fire, should be conducted. Without fire the objectives for blueberry production will not be met. Monitoring of blueberry plots was scheduled to continue through 2006. The monitoring schedule should be extended to continue monitoring for at least two years after burning is complete. If the results of this monitoring do not show increases in blueberry production, then harvest and post-harvest activities used to promote blueberries should be re-evaluated.

Background: *Riparian Management Monitoring*

Objectives and mitigation measures related to riparian management included:

Special attention shall be given to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water.

Locate artificial fuel breaks that involve soil disturbance outside of filter strips or riparian management zones (Mitigation Measure SW 9).

Avoid placement of piles for burning outside of filter strips or riparian management zones (Mitigation Measure SW 11).

Basal area retention guidelines apply in all riparian areas. A minimum of 25 – 80 BA in even-aged management stands and 80 BA in uneven aged stands will be maintained in riparian areas (Mitigation Measure SW 16).

Monitoring Activities: *Riparian Management Monitoring*

In FY 2005, three harvest units with riparian zone and filter strip requirements were monitored by the Blackduck District timber sale administrator and the Forest soil scientist.

Evaluation and Conclusions: *Riparian Management Monitoring*

Unit 1 The unit is adjacent to an open water wetland less than 10 acres in size. The recommended riparian management zone (RMZ) is 50 feet wide with a basal area retention of 25 to 80 BA. The RMZ on the ground was approximately 30 to 50 feet in width, uncut and 200 feet in length. The RMZ residual trees, evenly distributed, consisted of oak, aspen and a few jack pines. Soil disturbance was very limited and grasses and forbs were intact in the RMZ.

The use of prescribed fire to achieve site preparation is planned but the unit had not been burned at the time of monitoring. The fire lines are in. The fire lines did enter the filter strips and exposed bare soil up to the wetlands.

No erosion was evident on this site. The site did not meet the requirement for leave tree clumps. The site did have individual scattered reserve trees and snags and smaller diameter clumps present. There were no trash or oil spills.

Unit 2 The unit is adjacent to Ten Lake. The recommended RMZ is 100 feet with basal area retention of 25 to 80 BA. The RMZ on the ground was 100 feet except for a distance of approximately 50 feet where the filter strip narrowed to approximately 30 feet adjacent to the open water wetland. The blue boundary was painted closer to the wetland than required by the site level guidelines.

There is a sedge meadow inclusion within the unit. There was no evidence of skidding through the wetland, no operator generated slash in the wetland, and mineral soil exposure limited to less than 5%. On the east edge of the sale it appeared that harvesting equipment had made a single pass through a wetland.

This unit will use prescribed fire to obtain site preparation. The fire lines were in and there was a fuel break on a 13% slope for approximately 90 feet. Site level guidelines call for water bars every 80 feet on a 10% grade and a water bar every 50 feet on 15% grade. There were no water bars installed.

No erosion was evident on this site and it met the requirement for leave tree clumps. The site did have individual scattered reserve trees and snags present. There were no trash or oil spills.

Unit 3: The unit is adjacent to an open water wetland less than 10 acres in size. The recommended riparian management zone (RMZ) is 50 feet wide with a basal area retention of 25 to 80 BA. The RMZ on the ground was approximately 50 feet in width, uncut and 300 feet in length. The RMZ residual trees were evenly distributed comprised of jack pine, and oak.

Recommendations: *Riparian Management Monitoring*

While the guidelines were met for the most part, two of the three units monitored had what the observers felt were minor departures.

Under the 2004 revised Forest Plan riparian management areas are treated differently than in the 1986 Plan and differently from the Voluntary Site Level Guidelines. The Forest should conduct further training of timber markers, sale administrators and fire personnel to reduce the number of departures currently occurring.

b. Minnesota Forest Resource Council (MFRC) Site Level Guidelines Monitoring

Background:

In 1995, the Minnesota Legislature passed the Sustainable Forest Resources Act to ensure the sustainable management, use, and protection of the State's forest resources to achieve the State's economic, environmental, and social goals. The Act established the Minnesota Forest Resources Council (MFRC). The Council helps develop and implement initiatives from the Sustainable Forest Resources Act. While not legally subject to Minnesota statute, both the Chippewa and Superior National Forests actively participate with the Council in developing and implementing the voluntary forest management and landscape guidelines. According to the 2004 CNF Land and Resource Management Plan; "The Forest Service will implement the MFRC management guidelines when managing forest resources on the National Forest. These measures are described in *Sustaining Minnesota Forest Resources: Voluntary site-level Management Guidelines*." MFRC works with the Minnesota Department of Natural Resources (DNR) to conduct guideline monitoring that tracks how widely Minnesota's voluntary timber harvesting and forest management guidelines are used on public and private forestlands.

Monitoring Activities:

Monitoring looks at the level of guideline use and the capability of guidelines to meet their

intended objectives. Sites are selected randomly from the pool of sites across Minnesota that meet the following criteria:

- Sites are selected at random to ensure the results of each year's monitoring are truly representative of timber harvesting practices on public and private forestlands across the state.
- Sites must be reviewed within two growing seasons after trees are harvested. Monitoring will take place during spring or fall when deciduous trees have no leaves. (This makes it easier to see which timber harvesting and forest management activities were carried out on a site.)
- Permission will be obtained from all landowners before monitoring teams enter and monitor any harvest sites.
- Monitoring teams will look at measurable timber harvesting, forest roads, and general guidelines, which make up the bulk of the guidelines.
- Quality control teams will visit five to ten percent of all sites monitored to ensure the on-site evaluations of guideline implementation are consistent and accurate.

Full methods are available at:

http://www.frc.state.mn.us/Info/MFRCdocs/baseline_3_yr_monitoring_report.pdf or by contacting the MN DNR - Division of Forestry, 500 Lafayette Road, St. Paul, MN 55155 (651) 297-4924

In FY 2005, three of the sites that MFRC selected for monitoring occurred on the Chippewa National Forest. All three sites were on the Blackduck Ranger District and were harvest units that have been harvested in the last two years. Six elements were monitored at each site: Visual Quality, Cultural resources, Steep Slopes – Equipment Operation, Water Quality, Forest Roads and Skid Trails and General Site Conditions.

The monitoring occurred in the Spring of 2005 and was conducted by Tetra Tech EM, Inc. an independent contractor hired by MFRC in conjunction with MN Department of Natural Resources. Forest Service staff supplied detailed information on each site and visited the site with the contractors.

Evaluation and Conclusions:

The table below provides a summary of the results for each of the six elements monitored at three sites on the Chippewa National Forest. The arrows indicate points of departure from the MFRC guidelines.

Table 15: Summary of Site Level Guideline Monitoring FY 2005

Site 4846 Pine thinning	Monitoring Results
Visual Quality	Scenic Vista – harvest unit was not visible from vista
Cultural Resources	No Cultural resources noted
Steep Slopes – Equipment Operation	No steep or long slopes occur

Water Quality	One waterbody off-site. No direct or indirect impacts to waterbody. Filter strips not applicable.
Forest Roads and Skid Trails	<u>Skid trails:</u> >50% vegetated; no rutting > 6"; no erosion observed <u>Roads:</u> Temp road closed with berm/ seeded >50% vegetated Erosion and repeated rutting not observed
General Site Conditions	➡ Upland landing planted to pine but < 50% vegetated No evidence of fueling, spills or trash. ➡ Coarse woody debris < 2 logs/acre
Site 5912	Monitoring Results
Visual Quality	Scenic Vista present from Ten Lake. Apparent size of unit < 5 ac. Slash and landing not visible from lake vista
Cultural Resources	No Cultural resources noted
Steep Slopes – Equipment Operation	No steep or long slopes occur
Water Quality	No water bodies observed N/A
Forest Roads and Skid Trails	<u>Skid trails:</u> >50% vegetated; no rutting > 6"; no erosion observed <u>Roads:</u> Temp road closed with root wads >50% vegetated repeated rutting not observed small amount of erosion on Rd 1 but not reaching wetland
General Site Conditions	➡ 3 upland landings all < 50% vegetated but erosion and rutting not observed No evidence of fueling, spills or trash Slash distributed back on site Coarse woody debris at 2-5 logs/acre (intermediate) Oak retained >2 snags/acre > 12 scattered leave trees
Site 5916B	Monitoring Results
Visual Quality	2 Scenic Vistas present. Apparent size of unit < 5 ac. Slash and landing not visible from vistas but visible from road.
Cultural Resources	No Cultural resources noted
Steep Slopes – Equipment Operation	No steep or long slopes occur
Water Quality	3 water bodies in or adjacent to harvest unit. W1- W3 was not directly affected by harvest activity. ➡ Skid trail in filter strip for W2. ➡ RMZ recommends 100' filter strip around Blue Sky Lake – 33 x 50 ft area of RMZ was harvested. Coarse woody debris at < 4 logs/ac and no super canopy trees.

Forest Roads and Skid Trails	<p><u>Skid trails:</u> >50% vegetated; no rutting > 6"; no erosion observed</p> <p>5 skid trails observed. All > 50% vegetated.</p> <p>All have slope and length that suggest water bars or erosion control needed. Two segments had those controls in place, 3 did not but erosion was not noted.</p>
General Site Conditions	<p>➡ 1 upland landing < 50% vegetated but erosion and rutting not observed</p> <p>➡ Trash at landing</p> <p>No evidence of fueling, spills</p> <p>Slash distributed back on site and used as skid trail mat</p> <p>Coarse woody debris >5 logs/ac (high)</p> <p>Oak retained</p> <p>>2 snags/acre</p> <p>> 12 scattered leave trees</p>

These sites were likely harvested under the 1986 Forest Plan, however the MFRC Guidelines have been incorporated in our timber sales by contract since the original guidelines were published in 1999. While the MFRC Voluntary Site Level Guidelines are incorporated in the Forest Plan as guidelines, there may be standards and guidelines in the Plan that provide greater protection of resources. It is important to note that the monitoring results described below are measured against MFRC guidelines and not necessarily against all relevant Forest Plan Standards and Guidelines.

Past monitoring also occurred on the Chippewa National Forest in 2000, 2001 and 2002. The report can be found at:

http://www.frc.state.mn.us/Info/MFRCdocs/baseline_3_yr_monitoring_report.pdf

Recommendations:

Generally in FY 2005 the main area on non-compliance on National Forest lands lies in those best management practices or mitigation measures dealing with riparian management and re-vegetation/rehabilitation of log landings. There is generally high compliance for such things as road and trail rutting and erosion, leave trees and scenery management.

The MN DNR has now standardized its monitoring protocols for site level guideline compliance. Data should be more comparable over time.

Further training is needed on the Site Level Guidelines and on Forest Plan Standards and Guides for riparian management and coarse woody debris. The Forest should establish a procedure for ensuring that landings are adequately revegetated.

III. Research and Studies

1. Long-Term Soil Productivity Study

As part of a national long-term soil productivity study, soil porosity and organic matter are being experimentally manipulated on large plots to determine the impacts of such manipulation on growth and species diversity of aspen stands on the Chippewa National Forest. Sampling five years after treatments occurred on the Ottawa National Forest in Upper Michigan in 1996 and on the Huron-Manistee, lower Michigan, in 1997. Research was done in two areas on the Chippewa National Forest. The first is on the Marcell Experimental Forest in the Marcell Moraine Land Type Association (LTA) and it was started in 1991. The second study area is on the Pike Bay Experimental Forest in the Guthrie Till Plain LTA. That treatment began in 1993.

In August and July 2005, the vegetation was sampled during the 15th year at the Marcell site.

Results:

Preliminary findings on test plots indicate that disturbance treatments decreased 5-year growth of potential crop trees and delayed early stand development. Four test plots were prepared to determine the effects of soil compaction and organic matter removal on soil properties and growth of aspen suckers; associated species and herbaceous vegetation on stand development. The study involved winter harvest of 70-year-old aspen growing on loamy sand with site index of 65. The following treatments were applied to the sites:

- 1) whole tree harvest (trees lifted off the site with little or no ground disturbance from machinery)
- 2) soil compaction
- 3) forest floor removal and
- 4) soil compaction and forest floor removal.

After five growing seasons, numbers of suckers was extremely limited on the soil compaction areas. Mean diameter and height of regeneration was greatest on the whole tree harvest area. The treatment areas of soil compaction, forest floor removal or both all resulted in reduced biomass of foliage, stems, and total suckers to about one half of that produced on the whole tree harvest treatment. And, after five years, there was an abundance of saplings (>1 inch dbh) on the whole tree harvest area but few on the other treatment areas. Data collection (soil bulk density, soil strength, plant nutrient analysis and regeneration by species) continued in years seven and ten.

Rick Voldseth, a post- doctoral research scientist, was hired by the Forest Service North Central Research Station in Grand Rapids, Minnesota to summarize the LTSP data up to 10 years. Results and summaries are planned for publication during the winter of 2006/2007. Other than personal communication, preliminary results are not available at this time.

2. Soil Compaction Monitoring

Aaron Steber, a graduate student from the University of Minnesota - St. Paul, conducted a study to observe the degree of soil compaction from recently harvested timber on selected sites within the Chippewa National Forest. His research was funded by a study to look at methods to sample soils at FIA plots. Half of the sites were on loamy, fine-textured soils and half were on sandy, coarse-textured sites. In 2004, Aaron looked at the relationship of soil compaction and soil texture. In 2005, he looked at the relationship of soil compaction and landscape features. Preliminary results suggest that heavier textured soils are more susceptible to compaction and using only visual criteria for determining soil compaction may not relate to the actual degree of compaction on the site.

3. Releve Vegetation Monitoring

During the fall of 2005, discussions began with a Bemidji State University graduate student, Jeanne Ring, and her advisor, Mark Fulton to re-sample vegetation on permanent 10 X 10 meter releve plots within the Chippewa National Forest. Plans were made to conduct field sampling during the summer of 2006 and plots would be selected during the winter of 2005/2006 and the spring of 2006.

Objectives for the monitoring include:

- To evaluate the vegetation / soil effects of different harvesting techniques.
- To evaluate the effects of fire on the vegetation and surface soil layer.
- To observe successional pathways – without disturbance.
- To observe successional pathways with different types of disturbance.
- Use the information about the successional pathways and vegetation dynamics in the Terrestrial Ecological Unit interpretations.
- Monitor the effects of noxious weeds, earthworms or other invasive species.
- Establish productivity ratings for ecological units.

4. Goblin Fern (*Botrychium Mormo*)

Goblin fern, *Botrychium Mormo*, is a small species of moonwort found in rich hardwood forests in the northern portions of Minnesota. It is a Regional Forester Sensitive Species for Region 9. The “Conservation Approach for Goblin fern, *Botrychium Mormo* W.H.Wagoner” was completed December 2001.

One of the information needs identified for the Goblin Fern was to investigate the response of this species to changes in overstory vegetation and winter logging as would occur in some typical forest management practices. One of the known colonies of goblin fern on the Forest was chosen. The site selected for this study is south of Lower Sucker Lake (Township 144 North, Range 30 West, Section 3), where goblin fern colonies occur on either side of Forest Road 2135. The colony on the west side of the road (14 acres) was chosen as a control and the east side (17 acres) was chosen for treatment of a typical hardwood management practice.

During 1995, both sites were extensively searched for goblin ferns and each plant location was marked. Plot data was taken in 1995 and has continued through 2005. A timber harvest contract was awarded to implement the treatment. About 1/3 of the treatment stand was harvested early winter in 2006, but operations were suspended due to excessive soil disturbance. The remainder of the treatment is scheduled for winter 2006-2007. Plot data will continue to be collected until the treatment occurs, and post treatment plot data will be collected for a number of years, depending on the extent of the response and confidence in the results.

5. Red Pine Retention Study

North Central Research Station is conducting this study in cooperation with the Chippewa National Forest and University of Minnesota. The study area is located in the Tamarack Point area on the Deer River District which is administered by Joseph Alexander. Since its implementation, this project has gained national and international recognition and interest.

In currently managed, naturally regenerated and planted red pine stands, there is minimal variation in structure and composition relative to historic conditions. The study is designed to create red pine stands that more closely represent past ecosystems. This study uses partial harvests to reduce stands to the same basal areas but leaves remaining overstory trees in different spatial patterns on the landscape. The patterns include large gaps, small gaps, and traditional, evenly spaced thinning. Jack, red and eastern white pine were planted in the understory to increase structure and composition. The varying spatial patterns and densities of the overstory will be compared to the effects on growth and survival of regeneration, understory composition, site productivity, avian communities and disease incidence.

Results will be monitored for 5+ years after treatment. Logging began in August 2002 and was completed in April 2003. Planting was done in May 2003. Some ecosystem burning was also done in fall 2003. Data collection occurred in 2003 and 2004 and is planned for a number of years. Preliminary results are not yet available. Researchers have hosted several field trips to the site to discuss the study objectives, methodology, and data collection.

The Big Lake Management Plan Environmental Assessment covered this study (1999). The establishment report and study Plan is *Restoring Stand Complexity in Managed Red Pine (Pinus resinosa) Ecosystems Using Overstory Retention and Understory Control*, (Palik, Zasada, and Kern, 2003). The design and implementation of the project has involved the expertise and commitment of numerous resource professionals on the Chippewa Forest, especially on the Deer River and Blackduck Districts, and from North Central Research Station, University of Minnesota, and State and Private Forestry. It continues to draw the attention and interest of researchers and natural resource professionals across the country and even internationally.

IV. ADJUSTMENTS or CORRECTIONS TO THE FOREST PLAN

Since the Chippewa National Forest Land and Resource Management Plan (Forest Plan) was revised, Congress has enacted the 2005 Planning Rule which allows us to make non-substantive corrections or adjustments to the revised Forest Plan using a process called “administrative corrections”. Administrative corrections (36 CFR 219.7(b)) may be made at any time and are not plan amendments or revisions. Administrative corrections include the following:

- (1) Corrections and updates of data and maps,
- (2) Corrections of typographical errors or other non-substantive changes;
- (3) Changes in the monitoring program and monitoring information
- (4) Changes timber management projections; and
- (5) Other changes in the Plan Document or Set of Documents, except for substantive changes in the plan components.

We have recently issued seven administrative corrections and one errata to the Forest Plan set of documents. These include corrections to the Glossary and to the Monitoring section in Chapter 4, correction of typographical errors in three Forest Plan Guidelines, correction to a table used in the Executive Summary, corrections to the Scenic Integrity Objective map and an Errata to correct inconsistent wording between the Record of Decision and the Forest Plan.

The full corrections as well as the corrected pages from the set of Plan documents can be found at: http://www.fs.fed.us/r9/forests/chippewa/projects/forest_plan/index.php.

We will likely issue additional administrative corrections in the future. These will be available on the website above and we encourage people to use this resource for accessing the most up to date information on administrative corrections. Future corrections will also be listed in the Chippewa NF Schedule of Proposed Actions which is distributed quarterly. We will continue to provide opportunity for public involvement at the project level and during any substantive changes to the Forest Plan.

There have been no amendments to the revised Forest Plan.

V. LIST OF PREPARERS

The following people collected, evaluated, or compiled data for the fiscal year 2005 Monitoring and Evaluation Report:

Name	Discipline
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